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THE PHILIPPINE POPULATION: 1980–1990 SELECTED DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS*

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INTRODUCTION

The Philippine Medium-Term Development Plan (1993-98) views the country's path to development as anchored on three interdependent strategies: total human development, international competitiveness, and sustainable development. The latter strategy, sustainable development, considers the close interrelationships between population, resources, and environment.[1]

The country's high population growth during the second half of the 20th century—from 20 million people in 1950 to more than 65 million in 1990—has led to the use of technologies that have resulted in irreversible environmental damages. Philippine forest lands have been reduced from 10.4 million hectares in 1972 to 6.2 million hectares in 1990. Mangrove areas have been reduced from half a million hectares in 1918 to 130,000 hectares in 1990. Only 6 percent of the country's coastal coral reefs are still in good condition, and existing freshwater resources are threatened by pollution, overdrawing of groundwater, and saltwater intrusion in the aquifers.[2]

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1. Commission on Population, June 1995.
2. Fuentes, 1993.

During the last decade, a number of theoretical models have been developed through the use of which population-environment-development (PDE) interactions can be explored and better understood. One of these models is the Mauritius model developed by the Population Group of the International Institute for Applied Systems Analysis (IIASA) in Laxenburg, Austria. The model "gives a broad accounting framework which quantitatively specifies the most important and immediate effects of some sectors of the system on others. It is flexible in the sense that the user is free to choose different values for a large number of parameters, and to define any combination of possible trends and policies—as well as feedback mechanisms—through the tools of time-dependent interactive scenario setting. The PDE model aims at enhancing scientific understanding and demonstrating the longer-term consequences of alternative policies or external developments. Because people are the agents of change, population is taken as the point of departure that, together with many other factors, has an impact on development within environmental constraints."[3]

In February 1995, the Population Program of the East-West Center in Honolulu hosted a meeting between members of the IIASA staff responsible for the development Mauritius model and representatives of Philippine governmental and academic institutions to discuss the feasibility of applying a modified Mauritius model to the Philippines. During the meeting, a preliminary version of this paper was presented to highlight the current demographic situation of the Philippines and to exhibit the kind of demographic information available for the Philippines that eventually could serve as input for a Philippine PDE model.

Most of the information in this paper was taken from the 1980 and 1990 Censuses of Population and Housing. A good portion of them was collected and collated in the course of a project undertaken by the Office of Population Studies (OPS) of the University of San Carlos under contract with the Philippine Institute for Development Studies (PIDS).[4] Some portions dealing with demographic and socioeconomic characteristics of the Philippine population are taken verbatim from the PIDS report, and most maps and graphs presented here are copies of those originally produced by OPS for the PIDS project.

3. Wolfgant, 1993.
4. Office of Population Studies, University of San Carlos, 1993–95.

A BRIEF DESCRIPTION OF THE PHILIPPINES[5]

The Philippine archipelago, a chain of around 7,100 islands, is situated some 1,000 kilometers east off the coast of Southeast Asia in the warm and shallow waters between the Pacific and Indian Oceans. The islands, with a discontinuous coastline totaling close to 35,000 kilometers, are spread over the area between latitudes 4° 23' N and 21° 25' N and longitudes 116° E and 127° E. The archipelago is bounded by the South China Sea in the west, the Pacific Ocean in the east, the Sulu and Celebes Seas in the south, and the Bashi Channel, separating it from Taiwan, in the north. The greatest length of the archipelago north to south is 1,851 kilometers, and its greatest breadth east to west 1,107 kilometers.

The total land area covers 300,000 square kilometers, 92.3 percent of which is contained within the 11 largest islands.

Philippine topography includes lowland plains, high mountain ranges, and high-elevation plateaus. The largest mountain ranges, located almost parallel to each other in the northern part of Luzon, are the Sierra Madre and the Cordillera. The highest mountain, with a peak elevation of close to 3,000 meters, is Mount Apo in southern Mindanao.

There are about 106 volcanos spread all over the country, 19 of which are considered active. The most active among them at this time is Mount Pinatubo in Central Luzon, whose continuous eruptions have devastated and continue to devastate the rice bowl of the nation. Other active volcanos that have erupted repeatedly in recent decades are Mount Mayon in Bicol and Mount Taal in Cavite province, the latter situated some 50 kilometers from the center of Metro Manila.

The archipelago is prone to earthquakes. On the average, perceptible tremors are registered every other day. One of the most devastating earthquakes in recent years hit Baguio City and surrounding provinces in 1990, killing hundreds of people and destroying significant portions of the physical infrastructure in the affected areas.

Aside from small mountain streams, some 132 rivers traverse the Philippine countryside. These rivers are valuable as means of transportation and much more so as sources of irrigation for farms. The main rivers are the Cagayan River, the Agno River, and the Pampanga River,

5. National Statistics Office (NSO), 1989.

all on the island of Luzon. The Cagayan River, which has a length of 353 kilometers, drains a basin of about 20,000 square kilometers. In Mindanao, only the Agusan and Cotabato Rivers are partly navigable. In the Visayas, the central part of the Philippines, no large rivers are found. Sizeable lakes in the country number around 60, the largest of which, Laguna de Bay, 922 square kilometers in size, borders Metro Manila. In the past, it abounded with fish and other marine products, resources that are threatened today by industrial and residential pollution.

Until today, the farm sector has remained the prime mover of the country's economy, though its contribution to the Philippine GNP has been declining for many years. In 1988, agricultural contributions to the gross national product (GNP) amounted to some 17 percent. Between 1980 and 1990, the agricultural labor force (including fishing and forestry) has remained almost stagnant in terms of the number of employed workers (some 7.5 million); in terms of the country's total labor force, it absorbed 51 percent of all gainfully employed persons in 1980, but only 38 percent in 1990.

In 1987, 41 percent of the country's land area was agriculturally utilized. Of the food crops produced, more than 80 percent were used for domestic consumption. Food crops consist primarily of palay (rice), corn, fruits, nuts, vegetables, coffee, cacao, and peanuts, while coconut, sugarcane, abaca and tobacco are the major commercial crops.

In the past, forests have constituted one of the greatest natural resources of the Philippines. These forests have been fast disappearing since the last century because of indiscriminate logging and *kaingin* (slash-and-burn agriculture). Numerous laws and logging bans have done little to stop these practices. Between 1972 and 1990, the country's forest cover was reduced from some 102,000 square kilometers to 62,000 square kilometers. During the same period, virgin forests declined by 75 percent. As a result, large parts of the country suffer today from calamities such as soil erosion, floods, droughts, and a severe shortage of potable water.

Not long ago, the Philippines possessed an abundance of aquatic resources. Coastal marine waters, extending from shore to a depth of 200 meters, cover some 266,000 square kilometers. The country's coral reef area, the source of 15 percent of its total fish production, is estimated to extend over 27,000 square kilometers. Indiscriminate dynamite fishing in the past has destroyed many coral reefs and thereby significantly diminished the supply of fish. There used to be more than 2,000 identified species of fish caught in Philippine waters.

The contribution of fishery activities to the GNP hovered around one fourth of that provided by agriculture.

Geographically, the Philippine archipelago is composed of three major island groupings: Luzon in the north (47 percent of the country's land area), Mindanao in the south (34 percent of total land area), and the Visayas sandwiched between the two, covering the remaining 19 percent of the land area (Fig. 1). Administratively, the country is divided into provinces, of which there were 73 at the time of the 1990 Census. Provinces are subdivided into cities (60 in 1990) and municipalities (1,532), and the latter into barrios or barangays (40,904). For development purposes, provinces were combined into regions in the early 1970s. These regions have undergone repeated redefinitions. In 1990, 15 regions were distinguished, including the National Capital Region (the city of Manila plus 16 other contiguous cities and municipalities) and two "autonomous" regions, one located in the northern part of Luzon (Cordillera Administrative Region [CAR]) and the other in Mindanao (Autonomous Region of Muslim Mindanao [ARMM]).

From the time of the Spaniards, the Philippines has had an extremely centralized political and administrative structure. The Local Government Code, enacted in 1991, broke that tradition and transferred, through a process of *devolution*, larger powers of decision-making to local governments in provinces, municipalities and, in some limited way, also barangays. The latter serve as "primary planning and implementing unit of government programs, projects and activities and as a forum in which the collective views of the people in the community can be crystallized." In the course of this "devolution" of powers, the importance of regions was de-emphasized in favor of provinces.

Since 1990, the Mindanao regions have been realigned again through the creation of a new region, the Caraga. A new province, Sarangani, was carved out of the province of South Cotabato, the CAR province of Kalinga-Apayao was divided into two, and the sub-provinces of Biliran and Guimaras in the Visayas were upgraded to full provinces.

DEMOGRAPHIC DEVELOPMENTS IN THE 20TH CENTURY

1. Population size and growth

During the 20th century, the Philippine population doubled its size three times: from 8 million at the beginning of the century to 16 million at the start of World War II; then from 16 to 32 million between World

FIGURE 1. Regions and Provinces of the Philippines, 1990

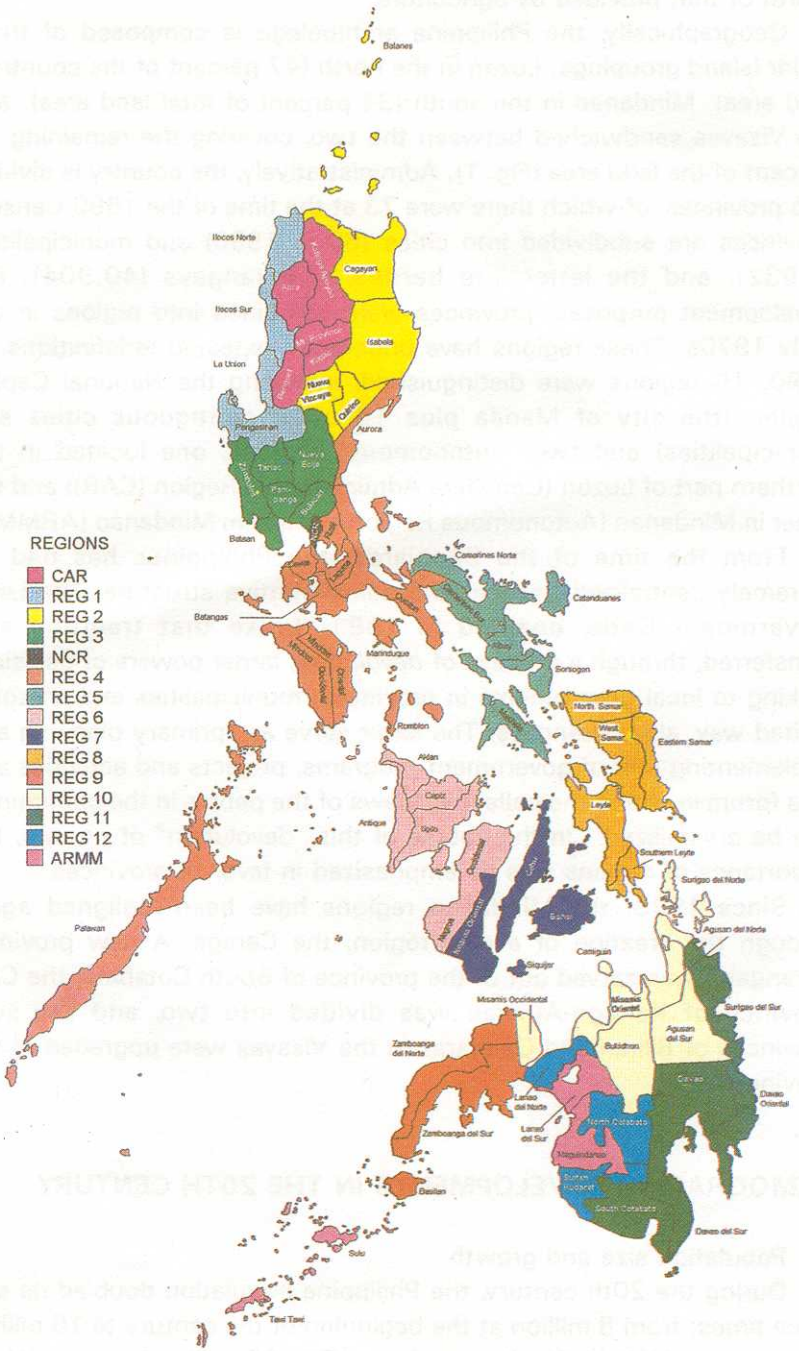


TABLE 1. Population and Land Area, by Region: Philippines, 1990

Region	Area (km²)	Population
ALL REGIONS	**300,000**	**60,559,419**
LUZON	**141,395**	**33,272,776**
NATIONAL CAPITAL REGION	636	7,907,386
CORDILLERA ADMINISTRATIVE REGION	18,294	1,141,141
ILOCOS (I)	12,840	3,547,269
CAGAYAN VALLEY (II)	26,838	2,336,350
CENTRAL LUZON (III)	18,231	6,188,716
SOUTHERN TAGALOG (IV)	46,924	8,247,120
BICOL (V)	17,633	3,904,793
VISAYAS	**66,606**	**13,016,266**
WESTERN VISAYAS (VI)	20,223	5,385,222
CENTRAL VISAYAS (VII)	14,951	4,582,180
EASTERN VISAYAS (VIII)	21,432	3,048,854
MINDANAO	**101,999**	**14,270,380**
WESTERN MINDANAO (IX)	15,997	2,454,319
NORTHERN MINDANAO (X)	28,328	3,502,674
SOUTHERN MINDANAO (XI)	31,693	4,448,616
CENTRAL MINDANAO (XII)	14,373	1,811,862
AUTONOMOUS REGION OF MUSLIM MINDANAO	11,608	2,052,917

War II and the mid-1960s, and to approximately 65 million shortly before the end of the century (Fig. 2). During the first of these doubling periods, which extended over almost 40 years, the average annual growth rate hovered around 2 percent. The second doubling, during which the average annual growth rate stood at 3 percent, was achieved in just half the time required for the first. Since the 1970s, population growth has been on a rather slow but steady decline (Fig. 3). About all population growth during this century has been the result of natural increase; international migration was and is insignificant.

Fig. 4 shows the estimated past and future course of the Demographic Transition in the country, i.e., the change from high birth and death rates to lower ones. The figure suggests that during the 1960s and 1970s, the country's birth rate did not fail to decline, as has often been claimed, but declined approximately at the same pace as the crude death rate, thereby leaving the rate of population growth almost unchanged. It was only around 1980 that the decline of the birth rate began to accelerate.

Population growth in the country did not proceed uniformly but varied from one area to the next. During much of the 20th century, the Visayas regions have supplied people first for Mindanao, and later for

FIGURE 2. Population Growth in the 20th Century, by Major Geographic Region

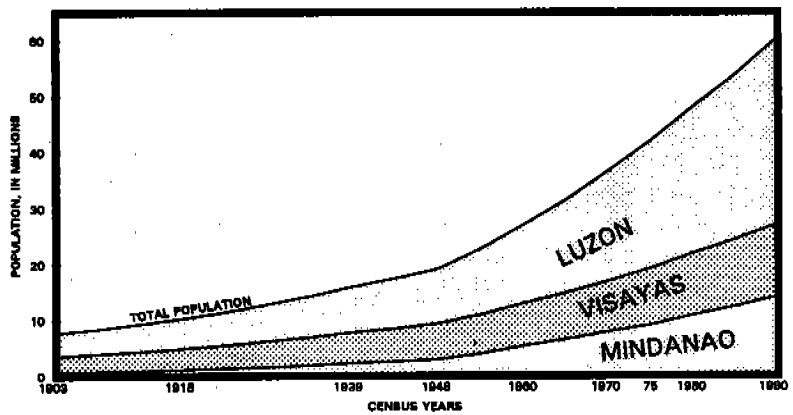
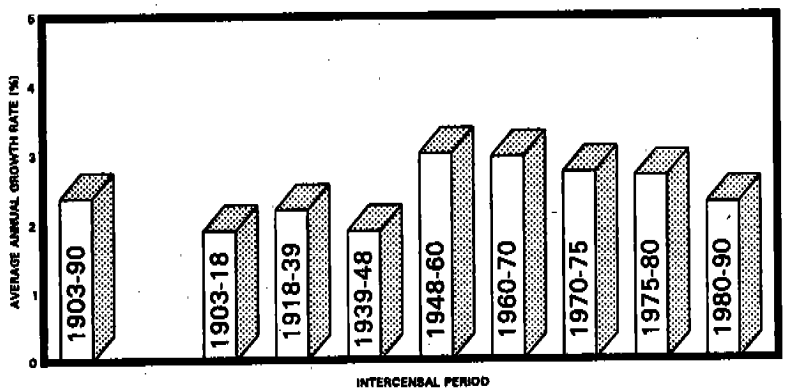


FIGURE 3. Population Growth, by Intercensal Period, 1903–1990



Metro Manila and Mindanao. In consequence, the Visayas have long been a *low* growth (or out-migration) area, in contrast to Mindanao and, somewhat later, Manila and surrounding provinces, which have been *high* growth (in-migration) areas (Fig.5). Historically, Mindanao has been the least populated region of the Philippines, promising open lands to willing settlers. By 1990, this situation had changed. Population growth centers in Mindanao such as Misamis Oriental, Davao del Sur and Lanao del Norte had reached population densities comparable to the more crowded provinces of Luzon only 20 years earlier. At the time of the 1990 Census, the population of Mindanao outnumbered that of the Visayas by 1.3 million.

FIGURE 4. The Demographic Transition (based on U.N. estimates and projections)

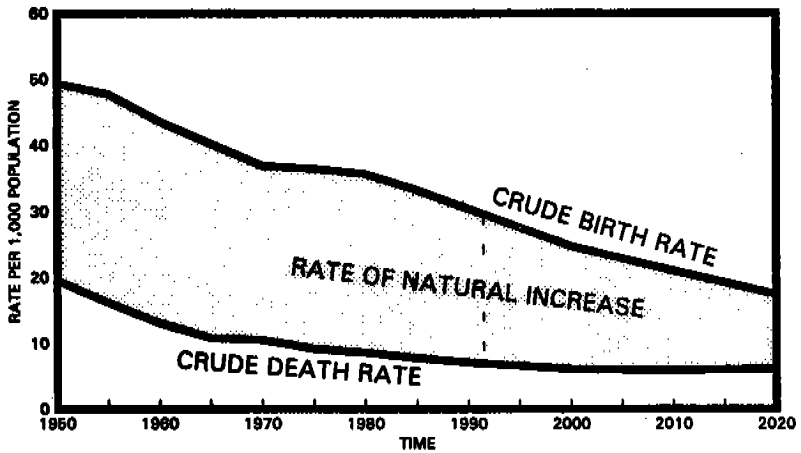
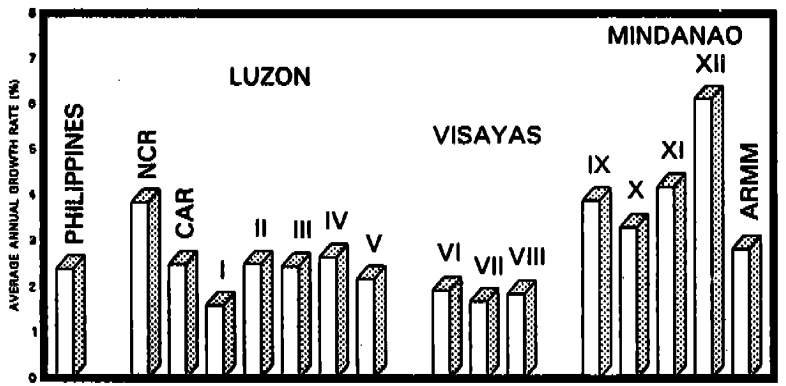


FIGURE 5. Population Growth Between 1903 and 1990, by Region



Population growth differentials in the country during the decade of the eighties were substantial, as Table 2 shows. The1980-90 intercensal growth rates of the 15 administrative regions of the country varied from a high of 36 percent in ARMM to a low of 9 percent in Eastern Visayas. Provincial variations of intercensal growth rates were even larger, ranging from 76 percent in Rizal to just a little more than 1 percent in Northern Samar.

During the 1980s, the country maintained its two traditional population growth centers: industrialized and densely populated Metro Manila and neighboring provinces, and those provinces in Mindanao with relatively large land resources indicated by low population density.

TABLE 2. Population Size and Population Growth Rate, by Region and Sex: Philippines, 1980 and 1990

	1980 Census			1990 Census			1980-90 Intercensal Growth (Percent)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
PHILIPPINES	**24,128,755**	**23,969,705**	**48,098,460**	**30,443,473**	**30,115,946**	**60,559,419**	**26.17**	**25.64**	**25.91**
Urban	8,765,276	9,178,621	17,943,897	14,546,493	14,893,437	29,439,930	66.00	62.26	64.07
Rural	15,363,479	14,791,084	30,154,563	15,896,980	15,222,509	31,119,489	3.47	2.92	3.20
NCR	2,855,712	3,070,172	5,925,884	3,835,879	4,071,507	7,907,386	34.32	32.61	33.44
CAR	462,647	451,785	914,432	577,366	563,775	1,141,141	24.80	24.79	24.79
ILOCOS	1,447,791	1,475,101	2,922,892	1,776,834	1,770,435	3,547,269	22.73	20.02	21.36
CAGAYAN VALLEY	978,535	940,556	1,919,091	1,191,427	1,144,923	2,336,350	21.76	21.73	21.74
CENTRAL LUZON	2,406,886	2,395,907	4,802,793	3,118,227	3,070,489	6,188,716	29.55	28.16	28.86
SOUTH. TAGALOG	3,095,075	3,023,545	6,118,620	4,167,406	4,079,714	8,247,120	34.65	34.93	34.79
BICOL	1,765,624	1,711,358	3,476,982	1,984,866	1,919,927	3,904,793	12.42	12.19	12.30
WEST. VISAYAS	2,265,780	2,259,835	4,525,615	2,708,512	2,676,710	5,385,222	19.54	18.45	18.99
CTRL. VISAYAS	1,882,242	1,905,132	3,787,374	2,291,584	2,290,596	4,582,180	21.75	20.23	20.99
EAST. VISAYAS	1,423,846	1,375,688	2,799,534	1,556,966	1,491,888	3,048,854	9.35	8.45	8.91
WEST. MINDANAO	1,002,798	970,469	1,973,267	1,248,110	1,206,209	2,454,319	24.46	24.29	24.38
NORTH. MINDANAO	1,402,083	1,356,902	2,758,985	1,782,081	1,720,593	3,502,674	27.10	26.80	26.96
SOUTH. MINDANAO	1,712,175	1,634,628	3,346,803	2,268,158	2,180,458	4,448,616	32.47	33.39	32.92
CTRL. MINDANAO	680,305	649,127	1,329,432	924,375	887,487	1,811,862	35.88	36.72	36.29
ARMM	747,256	749,500	1,496,756	1,011,682	1,041,235	2,052,917	35.39	38.92	37.16

In Luzon, 1980-90 intercensal population growth was correlated with distance from Metro Manila: the closer a province to Metro Manila, the higher its population growth rate. In Mindanao, population growth tended to be highest in territorially large and relatively sparsely settled provinces: Agusan del Sur (1990 density of 46 persons per km^2), Sultan Kudarat (92 persons per km^2), and Davao Oriental (76 persons per km^2).

Not a single province registered a population decline during the 1980s. Losses were incurred, however, in two administrative units of Metro Manila: the city of Manila and the municipality of San Juan. Manila's population declined from 1,630,485 in 1980 to 1,588,203 in 1990, and that of San Juan from 130,000 to 126,000. Population growth centers in Metro Manila during the 1980s were Las Piñas, which grew by 117 percent, and Muntinlupa and Taguig, both with intercensal population increases of close to 100 percent.

While there is no evidence of *population decline* in any of the larger geographic subdivisions of the country during the 1980s, the core area of Metro Manila excepted, there is ample evidence of a *decline of the population growth rate* almost everywhere. For the country as a whole, the population growth rate for the 1980s was some 15 percent below the corresponding rate for the 1970s: 2.7 percent versus 2.3 percent. The difference between an annual growth rate of 2.3 and 2.7 percent may not appear large, but for the Philippines, the lower rate implies, over a ten-year period, some 2.5 million people less.

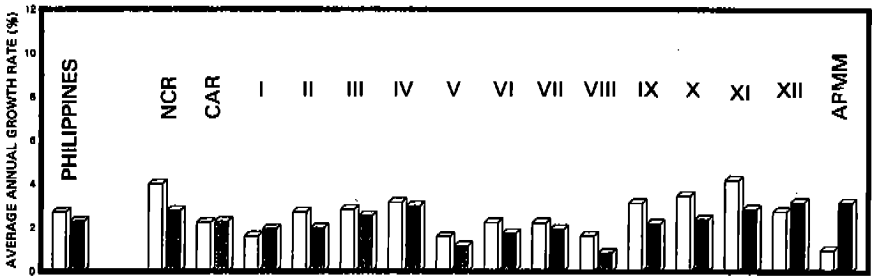
According to Fig. 6, 1980-90 intercensal population growth was below that of the preceding decade in 11 of the country's 15 regions. This decline affected 50 of the 73 provinces extant in 1990 and 15 of the 17 administrative units included in the National Capital Region.

Population growth rates with declining tendency during the 1980s applied mainly to regions that had experienced very high population growth during the preceding decade: NCR (average annual growth of 4 percent during the 1970-80 period compared to 2.9 percent between 1980 and 1990), Northern Mindanao (3.5 versus 2.4 percent), and Southern Mindanao (4.2 versus 2.9 percent). The same shift from very high growth during the 1970s to relatively low growth in the 1980s holds true for a number of provinces: Quirino, Mindoro Occidental, Basilan, Zamboanga del Norte, and the two Surigao provinces.

2. Urban population growth

The Philippine Census of 1970 classified 31.8 percent of the country's population as "urban." At the time of the 1980 Census,

FIGURE 6. Average Annual Intercensal Growth Rates: 1970–80 and 1980–90, Philippines and Regions



urban Filipinos accounted for 37.3 percent of the total population, and another ten years later, almost one half of all Filipinos were living in areas classified as urban. These figures imply that the pace of urbanization in the country during the 1980s was twice that of the preceding decade. No changes in the definition of *urban* were made between the censuses of 1970 and 1990, a definition based on criteria such as size and density of population, physical infrastructure and administrative functions of barangays.[6]

If urban-rural population figures reported by the censuses of 1980 and 1990 are taken at face value, they imply that 92 percent of all 1980-90 intercensal population growth was produced by the urban population and that the rural population had stagnated or, in some areas, declined. While such a situation is possible, it is rather unlikely because fertility in rural areas has continued at levels substantially higher than in urban places, and rural-urban migration of the magnitude needed to bring about an increase in the urban population from 18 to 30 million in a time span of ten years would have involved almost every fifth Filipino.

	1980 Census		1990 Census		1980–1990 Population Growth	
	Number	%	Number	%	Total	Annual
Total Population	48,098,460	100	60,559,419	100	25.9	2.3
Urban Population	17,943,897	37	29,439,930	49	64.1	5.0
Rural Population	30,154,563	63	31,119,489	51	3.2	0.3

6. NSO, 1983.

To measure the intercensal growth of the country's urban population, three different growth sources have to be considered: natural increase, in-migration, and reclassification of areas from rural to urban. While the census figures do not lend themselves to a breakdown of population growth into a natural increase and a migration component, the barangay-specific information which the 1990 Census collected makes it possible to separate population increase stemming from reclassification of barangays from other types of increase.

The barangay file of the 1990 Census contains information on 41,914 barangays located in 1,610 municipalities or cities. Of these barangays, about three fourths are classified as rural, and the remaining fourth as urban. Due to the renaming of barangays or the splitting of barangays into two or more, it is difficult to reconcile the 1990 listing of barangays with listings based on the 1980 Census. Direct comparisons between barangays listed in 1980 and 1990 can be made for some 93 percent of the 1990 barangays which, at the time of the 1990 Census, contained approximately 98 percent of the country's population. The summary below shows the percentage of all barangays that can be found in census lists of barangays for both 1980 and 1990.

Barangay Stratum In		% of All	Residents in 1990	% of Population
1980	1990	Barangays, 1990	(in millions)	in 1990
urban	urban	19.0	22.4	38.5
rural	rural	74.4	29.5	50.7
rural	urban	6.3	6.0	10.4
urban	rural	0.3	0.2	0.4

The figures indicate that about six million persons in 1990 were residing in urban barangays which ten years earlier had been classified as rural. When this figure is applied to the total increase of the urban population between the censuses of 1980 and 1990, then about one half (56 percent) of all urban population growth during the 1980s was the result of barangay reclassification from rural to urban. In the various regions of the country, the contribution of reclassification to the growth of regional urban populations varied from 48 (Central Visayas) to 90 percent (Western Mindanao).

Why were so many barangays reclassified from rural to urban between 1980 and 1990? Is it because during the 1980s the process of urbanization has speeded up, i.e., more barangays acquired social and economic characteristics associated with urban living?

The Philippine definition of urban, in use since 1970, specifies a number of criteria that have to be met by a barangay in order to be considered urban. These criteria can be divided into three groups: (a) size/density related, (b) facility/service related, and (c) labor-force related ones. Among these types of criteria, the Philippine definition gives first preference to size/density, presumably because of the assumption that large and densely populated places will tend to also display urban characteristics. According to the definition, every barangay located in a city or municipality having an average density of 1,000 persons or more is "urban." Because of continued high population growth, many cities and municipalities have reached this average density. As a result, all barangays located in them are urban regardless of any other characteristics they do or do not have.[7]

If only urban growth resulting from increase, natural as well as migratory is considered, then the average annual growth rate of the country's population that resided in urban barangays in 1980 comes down to 2.3 percent, less than half the figure shown on page 20. In 50 percent of the country's regions, average annual growth rates of the urban populations were still smaller, in some instances considerably so:

Region	Annual Growth Rate	Region	Annual Growth Rate
PHILIPPINES	**2.3 %**		
CAR	3.2 %	EASTERN VISAYAS	1.2 %
ILOCOS	1.3 %	WESTERN VISAYAS	1.8 %
CAGAYAN VALLEY	0.9 %	WESTERN MINDANAO	1.1 %
CENTRAL LUZON	2.3 %	NORTHERN MINDANAO	2.6 %
SOUTHERN TAGALOG	2.6 %	SOUTHERN MINDANAO	3.0 %
BICOL	1.2 %	CENTRAL MINDANAO	2.4 %
CENTRAL VISAYAS	2.4 %	ARMM	n.a.

7. A case in point is the city of Cebu, covering some 280 km^2 and a population in excess of 600,000 in 1990. Average population density in the city's 80 barangays was 2,160 persons per km^2. Since the currently used definition of "urban" considers all barangays in any city or municipality which, in its entirety, has a population density of 1,000 or more as urban, all Cebu City barangays are urban. This is so notwithstanding the fact that more than one fourth of these barangays are located in the rather low-density (50 to 300 persons per km^2) mountainous hinterlands of the city, many of them without direct road access to the built-up areas of the city, without electricity, communal water system, stores or other physical and social infrastructures usually associated with city life. The only claim to "urbanity" of these barangays is their location inside the city limits.

Urban growth centers in terms of in-migration during the 1980s in Luzon were Regions III and IV, in the Visayas, Region VII, and in Mindanao, Regions X and XII, i.e., the regions with the largest urban centers in the country.[8]

3. Population density

In 1990, the national territory of the Philippines of approximately 300,000 km^2 contained 60.5 million people. Had these people been equally distributed over the land area, each square kilometer would have held 202 persons, a relatively small figure by world standards. But people do not distribute themselves equally over any given area but tend to concentrate where livelihood opportunities are best. Since the latter do not remain constant but change because old resources become depleted and new ones are opened up, people constantly adjust by redistributing themselves, a process known as internal migration.

Table 3 shows differences in population density by region at the time of the 1990 Census. A large number of people was concentrated on the 636 km^2 of the NCR, resulting in an average density of 12,314 persons per km^2 in that area. By contrast, in the northern Luzon regions of the Cordillera and Cagayan Valley, average density was below 100. When NCR is excluded, the average density on Luzon at present is almost identical to that in the Visayas despite the fact that the latter has, for a long time, provided the bulk of in-migrants to Mindanao.

A clearer picture of population density is provided by Fig.7, which shows population density by province. The figure identifies two major population concentrations, the centers of which are the two largest metropolitan areas in the country: Metro Manila and Metro Cebu. Metro Manila is surrounded by high-density provinces such as Cavite (896 persons/km^2), Laguna (780), Pampanga (701), Bulacan (573), and Rizal (532). Around Metro Cebu, located on a relatively small island, no such concentrations can exist. Secondary population centers are indicated in Fig. 7 in southern Ilocos (La Union, Pangasinan), Bicol (Albay), and the Western Visayas (Iloilo).

In Mindanao, the least crowded major island of the Philippine archipelago, the highest population densities are found around the industrial and commercial centers Cagayan de Oro City (Misamis Oriental) and Davao City (Davao del Sur).

8. Because urban fertility in the country is appreciably lower than rural fertility, natural increase is a relatively minor factor in urban population growth.

TABLE 3. Population, Land Area, and Population Density, by Region: Philippines, 1990

Region	Area (km^2)	Population	Density (km^2)
ALL REGIONS	**300,000**	**60,559,419**	**202**
LUZON	**141,395**	**33,272,775**	**235**
NCR	636	7,907,386	12,432
CAR	18,294	1,141,141	62
ILOCOS	12,840	3,547,269	276
CAGAYAN VALLEY	26,838	2,336,350	87
CENTRAL LUZON	18,231	6,188,716	340
SOUTHERN TAGALOG	46,924	8,247,120	176
BICOL	17,633	3,904,793	221
VISAYAS	**56,606**	**13,016,256**	**230**
WESTERN VISAYAS	20,223	5,385,222	266
CENTRAL VISAYAS	14,951	4,582,180	306
EASTERN VISAYAS	21,432	3,048,854	142
MINDANAO	**101,999**	**14,270,380**	**140**
WESTERN MINDANAO	15,997	2,454,319	153
NORTHERN MINDANAO	28,328	3,502,674	124
SOUTHERN MINDANAO	31,693	4,448,616	140
CENTRAL MINDANAO	14,373	1,811,862	126
ARMM	11,608	2,052,917	177

The largest parts of almost all provinces in the Philippines are made up of agricultural lands which tend to have relatively low population densities. Highest densities are found in cities. Table 4 contains density information on 25 of the country's major cities.

Rather high population densities are indicated for the first five cities listed in Table 4, viz: Manila, Pasay, Mandaue, Caloocan, and Quezon. For most other cities, densities are comparatively low, and for some of them, notably Davao and Zamboanga, lower than average densities found in entire provinces identified earlier as secondary population centers. The reason for the low population density of most cities has nothing to do with any lack of crowding in their centers but with the large areas of agricultural or barren lands that they include within their boundaries. The most obvious case is that of Davao City, which occupies, with its more than 2,200 km^2 of "city area", one third of the entire province of Davao del Sur. Two thirds of the entire area of Cebu City consists of rugged mountain country populated by less than 10 percent of the city population.

FIGURE 7. Population Density, by Province, 1990

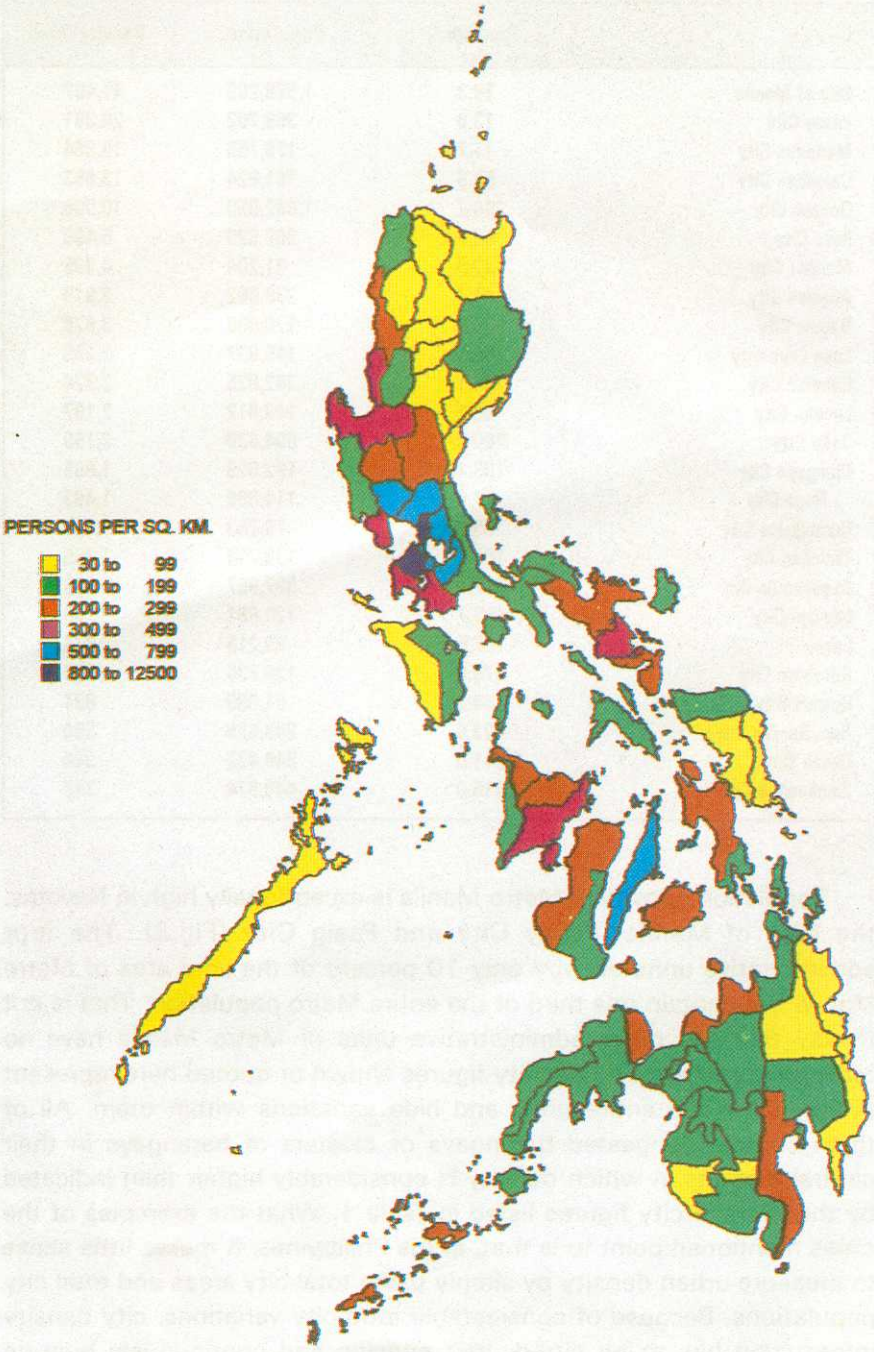
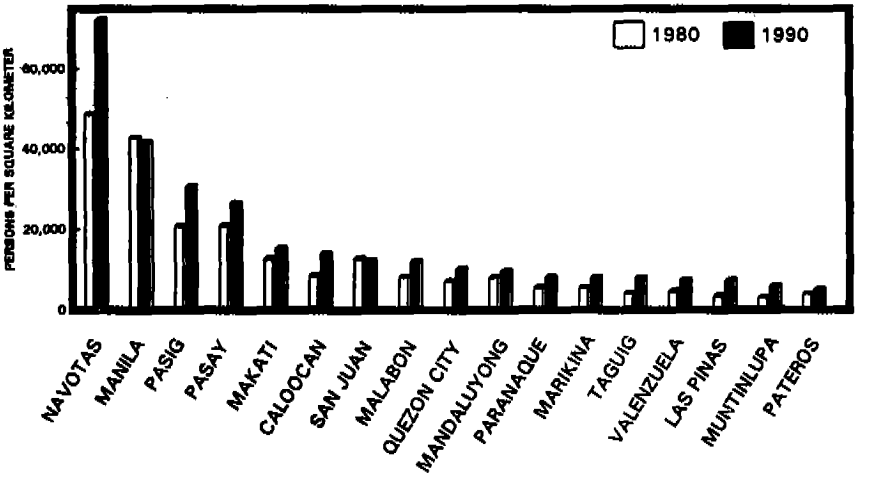


TABLE 4. Population, Land Area, and Population Density, Selected Cities: Philippines, 1990

City	Area (km^2)	Population	Density (km^2)
City of Manila	38.3	1,588,203	41,467
Pasay City	13.9	366,702	26,381
Mandaue City	11.7	179,753	15,364
Caloocan City	55.8	761,824	13,653
Quezon City	166.2	1,662,950	10,006
Iloilo City	56.0	307,620	5,493
Marawi City	22.6	91,204	4,036
Angeles City	60.3	236,062	3,915
Baguio City	48.9	179,858	3,678
Lapu Lapu City	58.1	145,627	2,506
Bacolod City	156.1	362,825	2,324
Lucena City	68.5	149,812	2,187
Cebu City	280.0	604,630	2,159
Olongapo City	103.1	192,629	1,865
Naga City	77.5	114,898	1,483
Dumaguete City	55.8	79,283	1,421
Tacloban City	100.9	136,714	1,355
Cagayan de Oro	412.8	337,957	819
Legazpi City	153.7	120,881	786
Laoag	107.5	83,215	774
Cotabato City	176.0	126,636	720
Ozamis City	144.2	91,039	631
Gen. Santos City	423.0	249,678	590
Davao City	2,211.0	846,472	384
Zamboanga Ciy	1,415.0	440,874	312

Population density in Metro Manila is exceptionally high in Navotas, the City of Manila, Pasay City and Pasig City (Fig.8). The four administrative units occupy only 10 percent of the land area of Metro Manila but contain one third of the entire Metro population. That is not to say that the other administrative units of Metro Manila have no crowding problems. All density figures shown or quoted here represent averages for the entire units and hide variations within them. All of them contain congested barangays or clusters of barangays in their central districts in which density is considerably higher than indicated by the average city figures listed in Table 4. What the examples of the cities mentioned point to is that, in the Philippines, it makes little sense to measure urban density by simply using total city areas and total city populations. Because of considerable intra-city variations, city density information has to be city-district specific and contiguously built-up

FIGURE 8. Population Density of Metro Manila and its Administrative Units, 1980 and 1990



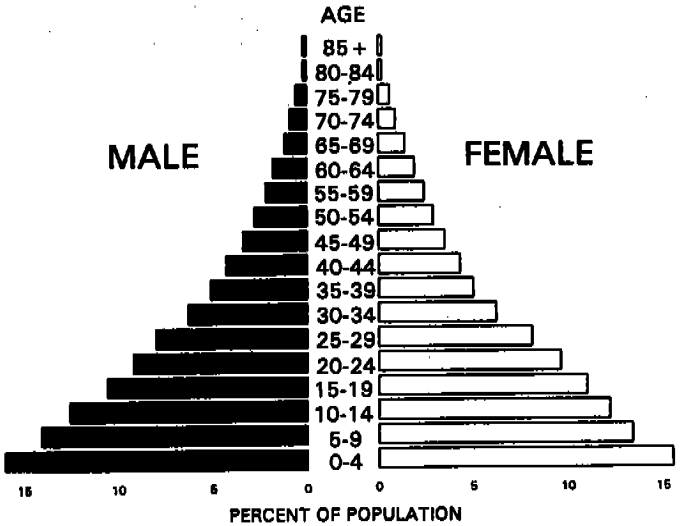
core areas of cities have to be separated from agricultural, unused or uninhabited lands included within the boundaries of most Philippine cities.

4. Population structure

The age pyramid of the total Philippine population for 1990 is rather smooth (Fig. 9). The broad base of the pyramid together with its sleek top is indicative of high fertility in the past, and the smooth surface points to the absence in the past of abrupt changes in either fertility, mortality or (international) migration. Whatever had been the changes in these demographic processes, they had occurred slowly and gradually.

The 1990 age structure of the country's population is young, i.e., the bulk of the people is young. The mean age of both males and females together stood at 24 years. By comparison, the 1990 mean age of the US population was around 34 years, and that of the West German population another six years higher. The median age stood at 19.7 years, meaning that 50 percent of all Filipinos in the country in 1990 were below 20 years of age. By contrast, the elderly (65 and above) accounted for only 3.4 percent of the entire population. The Dependency Ratio in 1990 stood at 76 dependents per every 100 persons of working age; 72 of these dependents were children under the age of 15, and only six were persons of retirement age (65 years and older).

FIGURE 9. Age Structure of Philippine Population, 1990



The age structure of the Philippine population is not a static but a changing one. Fig.10, which compares the age pyramid based on the 1980 Census with that of 1990, indicates that the population is slowly becoming older: mean and median ages increased between 1980 and 1990—the median age from 18.6 to 19.7 years, the proportion of people under 15 declined from 42 to 39.6 percent, and that of persons between 15 and 64 increased at the same time from 54.6 to 57.0 percent. The net result of these shifts was the decrease of the dependency ratio which, during the decade of the 1980s, declined from 83 to 76 per 100.

The main reason for the age-structural shift is declining fertility, a fact indicated by the shrinking base of the age pyramid. The narrowing of the base started some 15 years ago, and its pace increased over time. An approximate measure of the shrinking base is provided by the child-woman ratio (CWR), an age-structural measure defined as the number of children under 5 years of age per woman aged 15-49. At the time of the 1970 Census, the CWR stood at 0.69 children per woman of childbearing age; by 1980, it had declined to 0.66, and to 0.56 in 1990.

The Philippine population age structure is moving into the direction where the age structure of the urban population has moved for some time. Fig.11 contrasts the age structure of the 1990 urban population

ith that of the rural one. This contrast points to distinct fertility ferences between urban and rural folks and, at the same time, indicates the long-term effects reduced fertility will have on the age structure.

FIGURE 10. Age-structural Changes: Philippines, 1980 to 1990

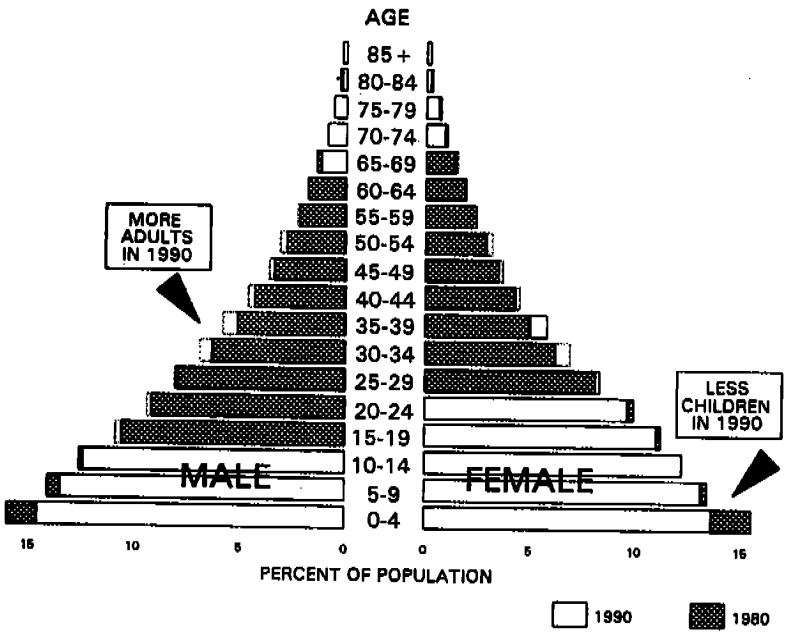
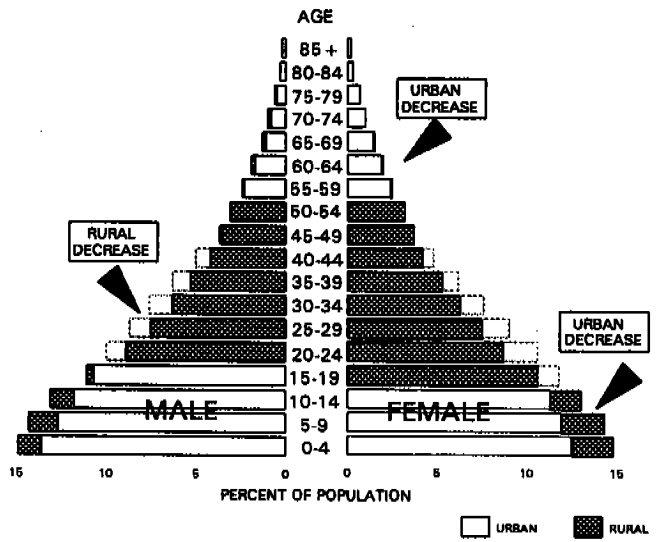


FIGURE 11. Age-structural Differences: Urban and Rural Philippines, 1990



It has to be noted that much of the urban "excess" population in the age groups 15-45 is the result of migration of young adults into the urban centers rather than entirely the consequence of age-structural changes brought about by low levels of urban fertility.

The figures in the table below express the differences between the urban and rural age compositions in quantitative terms. One additional distinction between the two types of population not directly related to population aging is that not only the proportion of children in the rural population is larger than in the urban but also the proportion of elderly people (65 and older). Expressed in terms of proportions of people in the population, the urban-rural difference appears small and does not yet warrant an emphatic statement that rural places provide homes primarily to children and the aged in the country. But the difference between urban and rural dependency ratios certainly is supportive of such a contention.

Age-structural Indicator	Urban	Rural
Mean age	24.5 years	23.5 years
Median age	21.0 years	18.6 years
Persons under 15	38.3 %	44.2 %
Persons 15-64	58.4 %	52.2 %
Persons 65 and older	3.3 %	3.6 %
Age dependency ratio	71.2/100	91.6/100

5. Fertility

The official population count of the 1990 Census of Population and Housing is 60,559,419 persons. The 1990 Census likewise provides the number of births that occurred between 1 May 1989 and 1 May 1990 (1 May is the official date to which the population counts refer): 1,746,076. Both of these figures are not without problems, a fact applying especially to the population data. According to a Technical Working Group on Population Projections established by the National Statistical Coordination Board, the 1990 census figure of 60.6 million is short by about 1.5 million.[9] Assuming that the number of enumerated 1990 births is correct, and applying to it the official census population figure, the resulting crude birth rate is 28.8 per 1,000 population; an application of a population figure 1.5 million larger to the

9. National Statistical Coordination Board (NSCB), 1992.

same number of births results in 28.1 births per 1,000, i.e., a crude birth rate that is smaller by 0.7 births per 1,000 population. There is no shortage of other estimates of the crude birth rate. For example, a POPCOM/USAID publication based on preliminary census results pegs the country's 1990 crude birth rate at 27.6 per 1,000,[10] and the ESCAP Population Data Sheet for 1990 suggests, on the basis of U.N. population projections, a crude birth rate of 31.8 per 1,000.[11] Because of problems inherent in all data sets used for the calculation of these rates, no clear-cut argument can be made that any one of them represents, or comes closest to, the actual rate.

The 1980 Census figures yield a crude birth rate for the country as a whole of 37.3 births per 1,000 population, i.e., a figure 30 percent higher than the crude birth rate of 1990. While the exact magnitude of the 1980 rate is as much in doubt as that for 1990, the important fact is the large difference between both rates, signaling a sizeable fertility decline over the 1980-90 intercensal period. Census-based crude birth rate declined in every region and province with the exception of a few provinces in Mindanao. While in 1980 some 68 out of the country's 73 provinces had crude birth rates in excess of 30 per 1,000 population, there were only 25 in 1990 with such high rates. The highest crude birth rates in 1990 existed in non-Muslim Mindanao (the low rates indicated for Muslim Mindanao are questionable), and the lowest in parts of the Ilocos and the provinces of Pampanga, Cavite and Laguna in the vicinity of Metro Manila.

While crude birth rates are the most often used measures of fertility, they are not entirely appropriate when it comes to the assessment of fertility changes or the comparison of fertility levels among different populations, such as those of provinces. The main reason is that they are influenced by the age structures of the populations to which they apply. A more appropriate summary measure of fertility for the purpose of comparing populations is the *Total Fertility Rate*, a synthetic measure indicating the total number of children an individual woman will bear if she survives to the end of her reproductive life and bears, throughout her childbearing years, children at the age-specific birth rates prevailing at the time of observation. The TFR is often taken as an indicator of average family size (children only). To obtain TFRs, age-specific birth rates have to be known.

10. Commission on Population, 1992.
11. Economic and Social Commission for Asia and the Pacific (ESCAP), 1990.

Philippine censuses do not provide information permitting to calculate age-specific birth rates; information on the number of annual births is collected by the country's Vital Registration System. Unfortunately, Philippine vital registration still suffers from under-enumeration, especially in its less developed regions, and forces those in need of detailed vital information to rely on indirect estimates. Fertility estimates of five-year averages of national, regional and provincial age-specific and total fertility rates based on the 1990 and earlier censuses of the Philippines have recently been made available.[12]

Table 5 displays TFR trends for the period 1965–70 through 1985–90. With the exception of Region IV, the trend in all regions is uniformly downward. And Region IV is no exception either because the indicated upward trend from1965-70 to 1975-80 is an artifact brought about when, in 1978, a number of highly urbanized (low-fertility) municipalities bordering Metro Manila were transferred from Region IV to the newly created NCR.

Fig.12 and 13, based on the Palmore estimates, illustrate some aspects of the fertility behavior of women of reproductive age: the age

TABLE 5. TFR Trends 1965–90: Philippines and its Regions

Region	1965–70	1975–80	1985–90
Philippines	**5.69**	**5.08**	**4.29**
NCR	3.18	3.02	2.81
CAR	5.83	5.20	4.69
Region I	5.43	5.05	4.20
Region II	6.71	5.82	4.59
Region III	5.70	4.82	3.77
Region IV	4.92	5.21	4.57
Region V	6.96	6.46	5.59
Region VI	5.47	5.34	4,64
Reg. VII	5.34	4.90	4.45
Reg. VIII	6.65	6.44	5.68
Region IX	6.17	5.59	4.91
Region X	6.59	5.51	4.98
Region XI	6.53	5.45	4.71
Reg. XII*	6.05	6.61	4.98
ARMM*	–	5.47	3.87

* unreliable.

12. Palmore, in-press.

of onset and termination of childbearing, the distribution of births over the reproductive life span, the peak (mean) age of childbearing, and the average total number of children a woman is expected to bear. Fig.12 compares these patterns for women aged 15–49 in 1980 with those in 1990, and Fig.13 delineates the range within which childbearing behavior in 1990 varied between women in the regions.

In 1990, the average Filipina started her childbearing as early as women ten years earlier had done and, as her predecessors, she continued beyond the age of 40. The peak childbearing age between 25 and 30 likewise remained stable. What did change between 1980 and 1990, and uniformly so for women of all childbearing ages, is the

FIGURE 12. Estimated Age-specific Fertility Rates: Philippines, 1980 and 1990

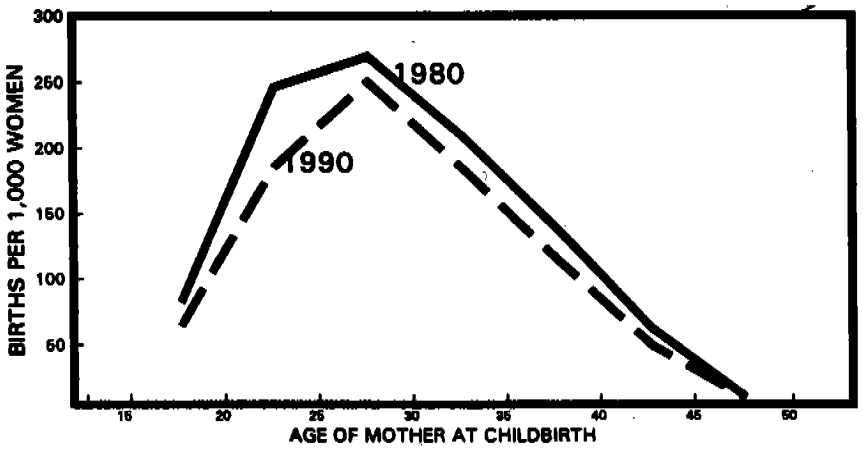
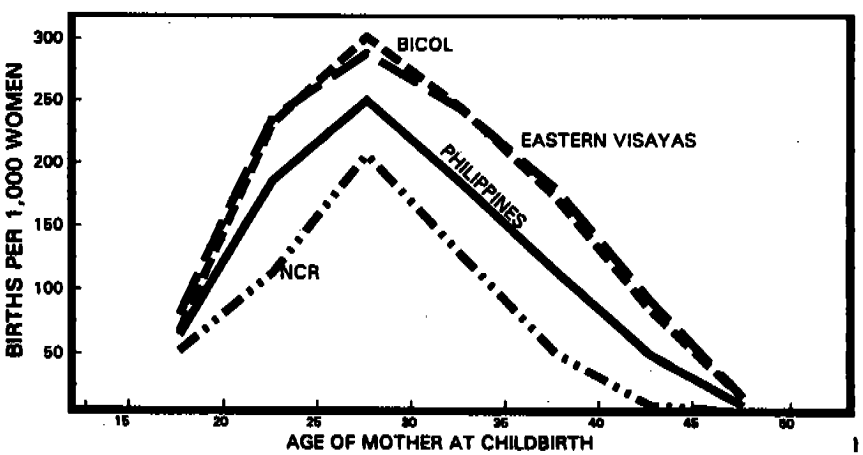


FIGURE 13. Estimated Age-specific Fertility Rates: Philippines and its Regions with Extreme Values



volume of births. The total fertility rate, represented by the area under the curve, declined by some 15 percent, from five live births in 1980 to 4.3 in 1990.

Fig.13 indicates the range within which regional fertility differed in 1990. In Bicol and Eastern Visayas, the total fertility level in 1990 exceeded the national level of 1990 by almost 25 percent, and the national level of 1980 by more than 10 percent. By contrast, 1990 total fertility in NCR was one third lower than the average national total fertility, and only one half of that in Bicol and Eastern Visayas.

6. Mortality

During the current century, the mortality level of the Philippines has declined substantially. Around 1950, Madigan and Lorimer pegged Philippine mortality at 20 deaths per 1,000 population annually, and the average life expectancy at birth at 43 years (both sexes combined).[13] Some 40 years later, the annual number of deaths per 1,000 population had declined to less than eight, and the average life expectancy at birth had increased by more than 20 years.[14] Historically, the decline of mortality is linked to socioeconomic modernization,[15] including such factors as improved medical technology, public health measures, and personal hygiene, as well as increased wealth needed to buy and use improved health care.

For calendar year 1990, the Philippine Vital Registration System reports 313,890 deaths. If this figure was correct, the country's crude death rate in 1990 would be 5.2 deaths per 1,000, almost identical to that of Singapore. While this particular rate is not impossible, its acceptance presupposes the correctness of the registered number of deaths, an assumption which, in view of past trends in Philippine death registration, is rather dubious. To obtain more realistic death figures, estimation techniques have to be used to assess the completeness of the level of death registration and to adjust the number of registered deaths according to the estimated level of registration completeness.

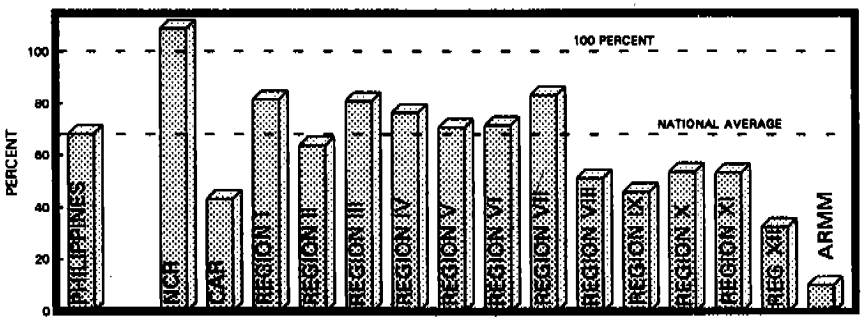
For the Philippines and all its regions and provinces, indirect age-specific mortality estimates exist since 1960.[16] According to estimates for 1990, the 313,890 registered deaths are approximately 30 percent

13. Madigan,1966, pp. 309–16; Lorimer, 1966, pp. 200–314.
14. Flieger and Cabigon,1994, pp. 200 and 212.
15. Goldscheider, 1971, p. 241.
16. Cf. Flieger, Abenoja and Lim, *op.cit.*, and Flieger and Cabigon, *op.cit.* The Philippine mortality situation outlined in this paper is based on the latter study.

short of the true number of deaths during that year.[17] Some two thirds of all unregistered deaths in 1990 had occurred to infants (under 1 year of age), and the estimated number of unregistered female deaths was by about 10 percent larger than that of males.

Under-registration of deaths in any given area tends to be correlated with the area's socioeconomic development: wherever socio-economic development is lacking, death registration tends to be low. Fig.14 shows that death registration in 1990 was highly incomplete in the Cordillera Region, Region VIII and most of Mindanao, especially in those areas containing large minority groups (Region XII and ARMM).

FIGURE 14. Level of Death Registration, by Region: Philippines 1990



The presence of a large city in a province seemingly contributes to a relatively high level of death registration. In the NCR and the province of Cebu and some other provinces most likely as well, death registration in 1990 exceeded 100 percent. This *over*-registration is not an artifact of the available data but results from the concentration of medical personnel, facilities and services in highly urbanized places that are used extensively also by residents from surrounding rural areas, many of whom happen to die while hospitalized in the city. In accordance with prevailing regulations, their deaths have to be registered by the hospital or clinic and reported to the *local* civil registrar.

1990 estimates of the country's crude death rate, adjusted for under-enumeration, indicate that 8.2 out of every 1,000 Filipino males had died in 1990; for females, the corresponding rate is 6.5. The estimate for men and women combined is 7.4 per 1,000. The 1990

17. Flieger and Cabigon, 1994 pp.191-92.

rates for males and females are approximately 12 percent lower than the crude death rates that had prevailed ten years earlier. At the provincial level, 1990 rates were lowest in Batangas, Pampanga, Rizal, and NCR (5.6), and highest in the Sulu archipelago, i.e., the same areas identified above as having low levels of death registration.

The magnitude of a population's crude death rate depends on a number of factors, not only the prevailing level of mortality. Foremost among such factors is the population's age and sex structure. If we define "level of mortality" as mortality net of other influencing factors, then, among populations with identical mortality levels, those with large proportions of elderly persons and males will have higher crude death rates than populations with large proportions of young people and women because of the higher risk of dying of males and older persons compared to women and the young. Because of this, crude death rates are not well suited for comparative purposes. One way of overcoming the age-sex structural contamination of crude death rates is standardization of the rates by age and sex, a procedure which assumes identical age and sex structures of the populations being compared. Taken alone, standardized death rates have no distinct meaning since their magnitudes are influenced by the standards chosen, but a comparison of standardized death rates of different populations shows the *mortality level difference* between these popuations independent of the factors for which the rates are standardized. For example, the crude death rate of the population of both sexes of the NCR in 1990 was 5.6 per 1,000 population, the corresponding crude rate for the Ilocos Region was 8.3. The difference between these two rates implies that, of every 1,000 persons, 2.7 more had died during 1990 in the Ilocos than in NCR, but it does not imply that the *mortality level* in the Ilocos was 50 percent higher than the NCR level. When both rates are age-sex standardized, i.e., age-sex structural differences between the two populations are held constant, the mortality difference between them shrinks to just 0.58 more deaths per 1,000 population in Ilocos than in NCR. Expressed differently, some 80 percent of the difference between the crude death rates of NCR and Ilocos was caused by the age-sex structural dissimilarities between the two regions, *not* by mortality.

Aside from provincial crude death rates, Table 6 lists the 1990 age-sex standardized deaths rates for the regions. The fourth column in Table 6 shows the percentage by which any given provincial mortality level in 1990, net of age and sex-structural influences, differed from the average national mortality level in 1990.

TABLE 6. Crude- and Age-sex Standardized Death Rates, by Region: Philippines, 1990 (rates for both sexes combined)

Region / Province	Crude Death Rate	Standardized Death Rate	% Difference Local-National Mortality Level
PHILIPPINES	7.36	7.50	
NATIONAL CAPITAL REGION	5.62	6.65	- 11.3
CORDILLERA (CAR)	9.03	9.15	+ 22.0
ILOCOS REGION (I)	8.29	7.23	- 3.6
CAGAYAN VALLEY (II)	8.18	8.30	+ 10.7
CENTRAL LUZON (III)	6.23	6.20	- 17.3
SOUTHERN TAGALOG (IV)	6.91	7.19	- 4.1
BICOL (V)	8.01	7.97	+ 6.3
WESTERN VISAYAS (VI)	8.01	7.82	+ 4.3
CENTRAL VISAYAS (VII)	7.38	6.89	- 8.1
EASTERN VISAYAS (VIII)	9.82	9.56	+ 27.5
WESTERN MINDANAO (IX)	8.05	8.91	+ 18.8
NORTHERN MINDANAO (X)	7.93	8.42	+ 12.3
SOUTHERN MINDANAO (XI)	7.05	7.78	+ 3.7
CENTRAL MINDANAO (XII)	7.64	8.65	+ 15.3
MUSLIM MINDANAO	10.58	13.87	+ 84.9

SOURCE: Flieger and Cabigon, 1994.

A relatively comprehensive description of a population's mortality situation is provided by life tables. Table 7 contains Philippine male and female life table estimates for the year 1990.

The life tables (Flieger and Cabigon 1994) list, aside from other mortality parameters, two mortality measures of special interest. The first is the *infant mortality rate*, i.e., the probability of an infant to die before completing the first year of life ($_nq_o$). Estimates for calendar year 1990 peg average Philippine infant mortality at 60 out of 1,000 live births for males, and 53 for females. Regional and provincial infant mortality rates deviate widely from the national average. As Fig.15 shows, regional levels vary from a little more than 40 deaths per 1,000 live births in Central Luzon (Region III) to about 80 in the Eastern Visayas (Region VIII) and Muslim Mindanao (ARMM). Differences in provincial infant mortality levels are depicted in Fig.16. These differences imply more than just variations in local mortality situations: infant mortality rates, which tend to be high in areas with low standards of living, are considered good proxy measures of living standards themselves and, by implication, of overall development. The

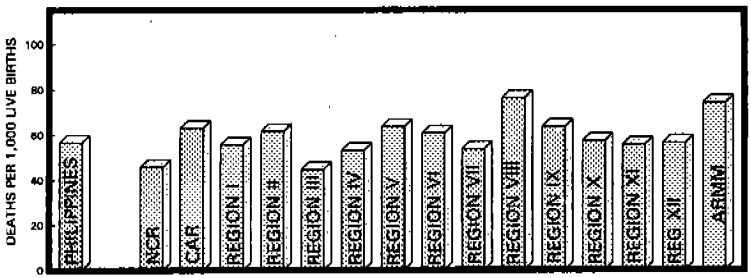
TABLE 7. Life Table Estimates, by Sex: Philippines, 1990

AGE		$_nM_x$	$_nq_x$	l_x	$_nd_x$	$_nL_x$	$_nS_x$	T_x	e_x
0		0.06281	0.05986	100000	5986	95299	0.93164	6220178	62.202
1		0.00591	0.02329	94014	2190	370523	0.98218	6124880	65.148
5		0.00140	0.00698	91824	641	457521	0.99406	5754357	62.667
10		0.00098	0.00489	91184	446	454806	0.99396	5296836	58.090
15		0.00158	0.00787	90738	714	452060	0.98922	4842030	53.363
20		0.00281	0.01396	90024	1257	447187	0.98395	4389970	48.764
25		0.00360	0.01784	88767	1584	440009	0.98032	3942783	44.417
30	M	0.00434	0.02147	87183	1872	431349	0.97702	3502775	40.177
35		0.00501	0.02475	85311	2111	421434	0.97198	3071426	36.003
40	A	0.00651	0.03205	83200	2667	409627	0.96220	2649992	31.851
45		0.00908	0.04444	80533	3579	394143	0.94766	2240364	27.819
50	L	0.01259	0.06111	76954	4703	373515	0.92908	1846221	23.991
55		0.01715	0.08237	72252	5952	347027	0.90052	1472706	20.383
60	E	0.02517	0.11864	66300	7866	312504	0.86528	1125679	16.978
65		0.03312	0.15326	58435	8956	270405	0.81787	813175	13.916
70		0.04889	0.21852	49479	10812	221156	0.73584	542770	10.970
75		0.07679	0.32319	38667	12496	162736	0.59550	321614	8.318
80		0.13495	0.49973	26170	13078	96909	0.44497	158878	6.071
85		0.18738	0.61717	13092	8080	43121	0.33939	61969	4.733
90		0.24665	0.72020	5012	3610	14635	0.22353	18848	3.760
95		0.33287	1.00000	1402	1402	4213	-	4213	3.004

Table 7: Continued

AGE		$_nM_x$	$_nq_x$	l_x	$_nd_x$	$_nL_x$	$_nS_x$	T_x	e_x
0		0.05572	0.05337	100000	5337	95784	0.93654	6744552	67.446
1		0.00646	0.02542	94663	2406	372485	0.98184	6648767	70.236
5		0.00132	0.00658	92257	607	459766	0.99451	6276283	68.031
10		0.00088	0.00439	91650	402	457243	0.99520	5816517	63.465
15		0.00109	0.00544	91247	496	455047	0.99371	5359274	58.733
20	F	0.00144	0.00718	90751	651	452186	0.99222	4904227	54.040
25		0.00168	0.00837	90100	754	448667	0.99088	4452041	49.412
30	E	0.00202	0.01005	89346	898	444574	0.98833	4003374	44.807
35		0.00272	0.01351	88448	1195	439385	0.98465	3558800	40.236
40	M	0.00351	0.01740	87253	1519	432642	0.97965	3119415	35.751
45		0.00485	0.02398	85735	2056	423838	0.96997	2686773	31.338
50	A	0.00749	0.03680	83679	3079	411112	0.95763	2262935	27.043
55		0.00997	0.04870	80600	3925	393693	0.93966	1851823	22.976
60	L	0.01538	0.07420	76675	5690	369937	0.91083	1458130	19.017
65		0.02260	0.10728	70985	7615	336950	0.86396	1088192	15.330
70	E	0.03765	0.17296	63370	10960	291111	0.77428	751242	11.855
75		0.06819	0.29327	52410	15370	225401	0.61557	460131	8.779
80		0.12973	0.48597	37040	18000	138751	0.46911	234730	6.337
85		0.16965	0.57998	19039	11042	65089	0.36467	95979	5.041
90		0.23852	0.70796	7997	5662	23736	0.23158	30890	3.863
95		0.32649	1.00000	2335	2335	7153	–	7153	3.063

FIGURE 15. Level of infant mortality, by region: Philippines, 1990 (average for both sexes)



geographic distribution of high infant-mortality areas makes it clear that severely un- or underdeveloped pockets exist not only in Mindanao and the Visayas but in Luzon as well. Among the least developed areas are those inhabited by tribal and religious minority groups: the Cordilleras in northern Luzon, and the Muslim areas in southern Mindanao.

The second type of mortality measures of special note in the life tables are the *life expectancy* estimates (e_x), i.e., the average number of life years a person of exact age x can expact to live provided the age-specific mortality patterns existing at the point in time to which the life table refers prevail throughout the life time of that person. At the estimated mortality level of 1990, a Filipino boy born in 1990 could expect an average life of some 62 years, and a Filipino girl a lifetime of 67 years.

That life expectancies of women exceed those of men is the general world pattern, and life expectancies reported by developed countries reveal another tendency, namely, that gender differences in life expectancy at birth increase as the overall mortality level of a population decreases. This particular tendency is observable in the Philippines: in Central Luzon, where mortality levels in 1990 were lowest, the gender difference in life expectancy at birth amounted to some six years; in the Sulu archipelago, an area with high mortality in 1990, the corresponding difference was a full two years shorter.

At present, it is not at all the average length of life Filipinos can look forward to that matters but the great disparity in life expectancy found in various parts of the country that ought to cause concern: while women in Batangas and Pampanga in 1990 had an average life expectancy at birth of over 72 years, and men of almost 67 years, their counterparts in Sulu and Tawi Tawi had approximately 20 years less, i.e., 52 and 48 years.

FIGURE 16. Infant Mortality Rates (Both Sexes), by Province: Philippines, 1990

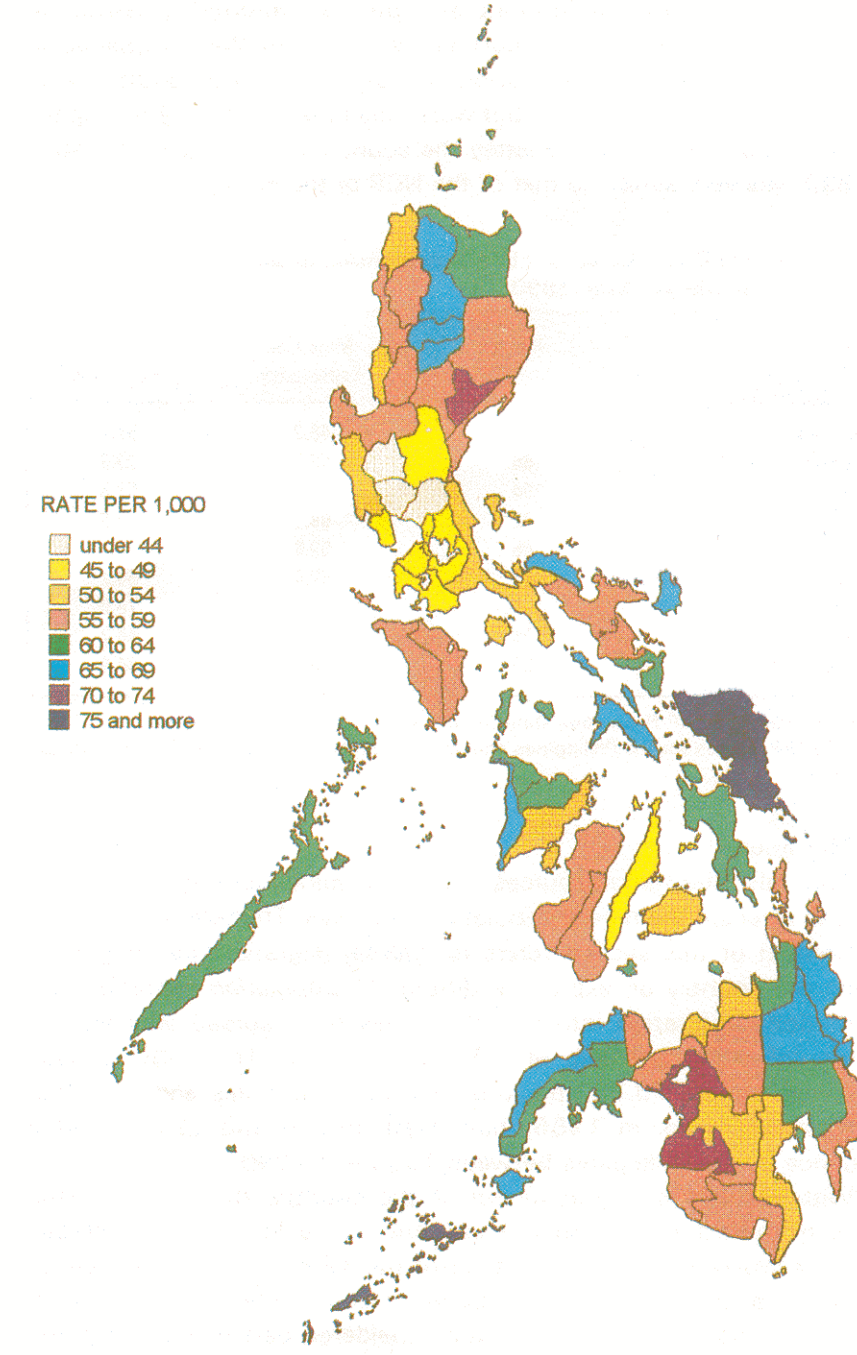


Table 8 places the Philippine mortality situation in a Southeast Asian context. The information makes the point that, with respect to mortality level, the Philippines occupies a "middle" position in Southeast Asia. The overall mortality situation in the Philippines in 1990 was better than the conditions existing in Cambodia, Laos, Burma, Vietnam and Indonesia, but worse than the situation of Singapore, Malaysia and Thailand. In the latter, the country-wide mortality situation in 1990 was very similar to that of the NCR of the Philippines.

TABLE 8. Crude Death Rates and Life Expentancies at Birth in Southeast Asia, 1990

Country	Infant Mortality Rate	Male Life Expectancy	Female Life Expectancy
Cambodia	123	48.3	51.2
Indonesia	65	59.7	63.3
Laos	104	48.3	51.3
Malaysia	22	68.1	72.3
Myanmar	65	59.6	63.1
Philippines	43*	62.4*	66.2*
Singapore	7	71.3	76.9
Thailand	26	64.1	68.2
Vietnam	59	60.4	64.8

SOURCE: 1990 ESCAP Population Data Sheet. Bangkok, 1990.
* The ESCAP figures for the Philippines shown differ somewhat from the Flieger-Cabigon estimates.

7. Migration

The only information sources in the Philippines for migration at the national level are the recent population censuses. The term *migration* in the context of this section refers to *internal* migration, i.e., migration within the country or, expressed differently, *population redistribution*. International migration into the Philippines from abroad was and is, demographically speaking, of little consequence. The 1990 Census registered a mere 70,732 persons, half of them males and the other half females who, in 1985, had lived abroad and established a residence in the Philippines between 1985 and 1990.

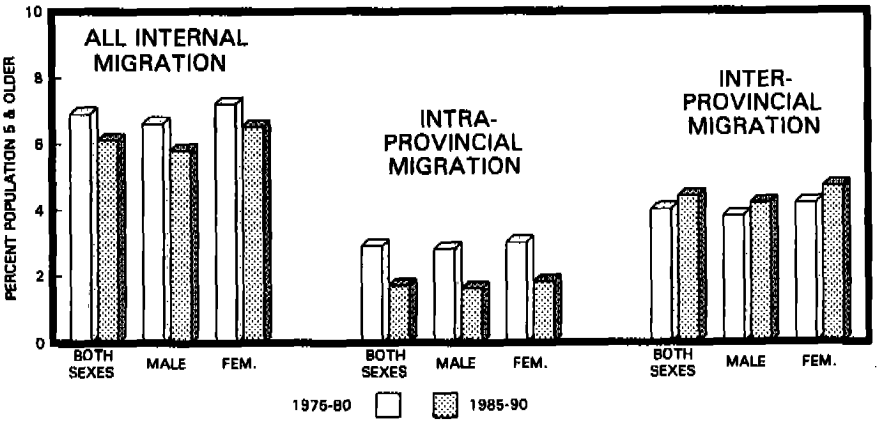
With respect to migration out of the country, the 1990 Census offers no information with the exception of a listing of "Overseas Contract Workers" who, at the time of the 1990 Census, were either home on vacation or out of the country temporarily (not longer than five years) and, for that reason, still considered part of the Philippine

population. The 1990 Census counted approximately 420,000 of such workers, whose absence from the country has little effect on the population age structure but some adverse repercussions on the make-up of the trained labor force. From an economic point of view, the outflow of labor from the Philippines is of importance because it constitutes one of the country's major foreign exchange sources.

Data collected by the population censuses of 1980 and 1990 show that, relative to the 1975-80 period, the absolute number of internal migrants aged 5 years and older between 1985 and 1990 had increased, from 2.85 to 3.24 million (Fig. 17). However, the proportion of the population 5 years and older involved in internal migration had decreased. In 1980, some 7.1 percent of all persons 5 years and older reported that they had lived elsewhere five years earlier; ten years later, the corresponding proportion amounted to only 6.3 percent. While the just cited numbers and proportions are smaller than the actual ones because they exclude persons under age 5 and migrants who either had died or returned home between the census dates, they do provide some glimpse of the general situation.

According to Fig. 17, all decrease in internal migration from the late 1970s to the late 1980s was the result of a decline in the number of *intra-provincial* migrants: the proportion that intra-provincial migrants represented of the total population 5 years and older in 1990 was some 40 percent smaller than the corresponding proportion ten years earlier. By contrast, the proportion of *inter-provincial* migrants increased by 10 percent over the same period.

FIGURE 17. Internal Migration of Persons 5 Years and Older, by Type of Migration and Sex: Philippines, 1975–80 and 1985–90



The decline in intra-provincial migration from the late 1970s to the late 80s occurred in almost all provinces of the country. Within NCR, movements of persons between cities and municipalities in the second half of the 1980s involved 2.13 percent of the 1990 population, a figure still above the national average of 1.7 percent. However, ten years earlier, the corresponding proportion had been more than twice that large: 4.6 percent.

In contrast to intra-provincial migration, residential movements *among* provinces increased from the late 70s to the late 80s, involving some 2.3 million intercensal migrants in the latter of these two periods. In 46 of the country's 73 provinces in 1990, the proportions of persons who, five years earlier, had lived in other provinces, exceeded the corresponding proportions of ten years earlier. More than one third of all inter-provincial migrants between 1985 and 1990, some 812,000, had settled in Metro Manila. Adding to these the approximately 350,000 who had settled in the neighboring provinces of Bulacan, Cavite, Laguna and Rizal, the proportion of all 1985–90 inter-provincial migrants that had settled in and around Metro Manila accounts for one half of all such migrants. By comparison, the total number of inter-provincial migrants who had settled in Mindanao is only slightly more than one half of those who had moved to Metro Manila: some 450,000. The trend displayed in the migration figures of the 1990 Census confirms what all censuses since 1970 have shown: the in-migration center of the country is no longer Mindanao but Metro Manila and surrounding provinces. The importance of Metro Manila and neighboring provinces as in-migration center is clearly indicated in Fig.18.

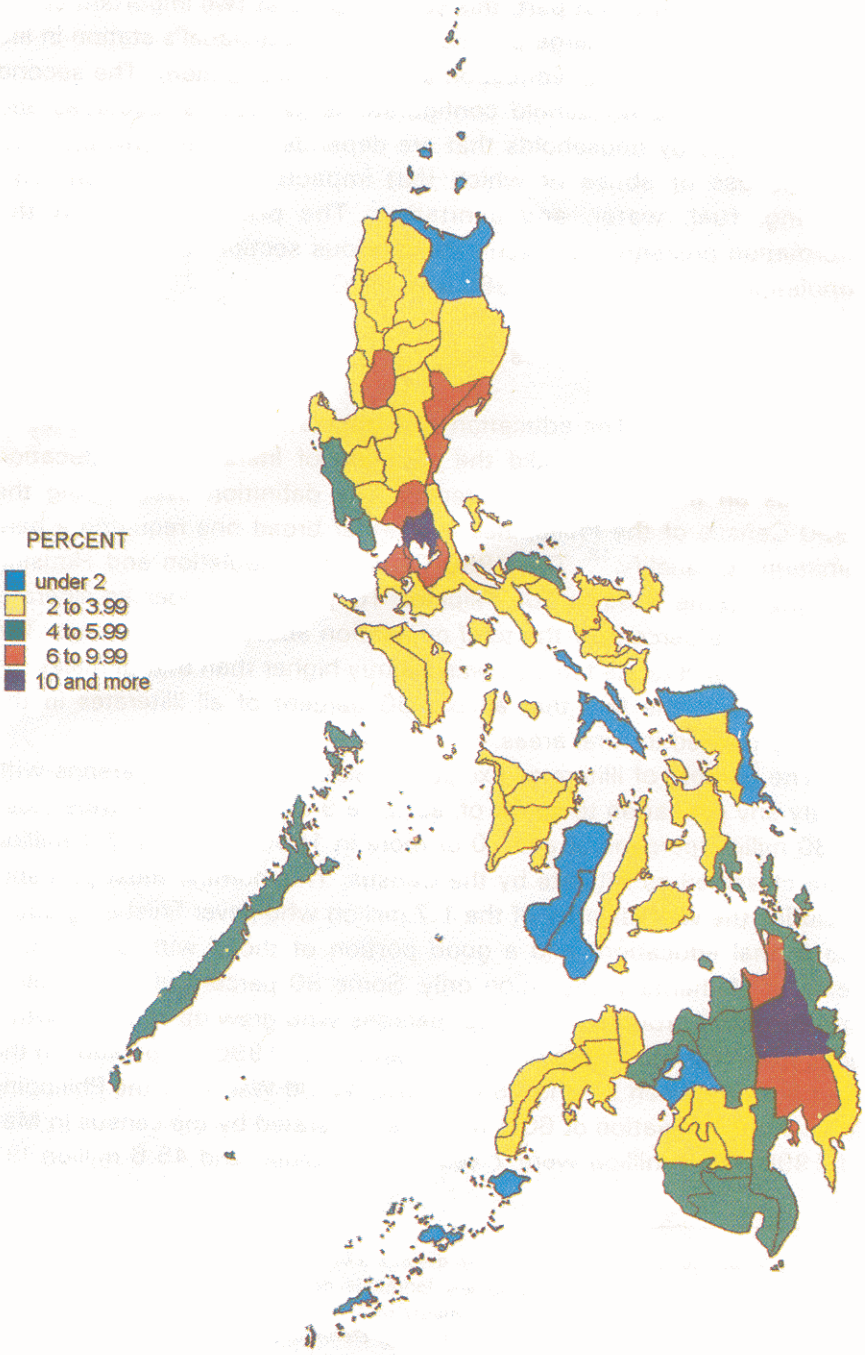
Provinces distant from Metro Manila that have attracted relatively large numbers of migrants in the late 1980s were Misamis Oriental, Agusan del Sur and Davao del Norte in Mindanao.

Reduced in-migration during the 1985–90 period was registered in the Cordilleras, Cagayan Valley, most island provinces of the Southern Tagalog region, and in two thirds of all Mindanao provinces. Provinces with practically zero in-migration during the 1980s were the Muslim areas of Lanao del Sur, Basilan, Sulu, and Tawi Tawi.

SOCIOECONOMIC CHARACTERISTICS

The demographic section of this report addresses the first variable of the 'Population-Environment-Development' triad, the people. This section outlines briefly selected aspects of the environment in which

FIGURE 18. Percentage of Inter-provincial Migrants, by Province: Philippines, 1990



the people live and the change that the environment is undergoing. The term *environment* as used here refers to both the *social* and the *natural* environment. In the first part, this section looks at two important social characteristics that in large part determine an individual's station in life and his or her life style: education and work (occupation). The second section describes household configurations as well as resources and facilities used by households that are dependent on the environment, and the use or abuse of which that impacts on the environment: housing, fuel, water, and sanitation. The prime sources of the information presented are, as in the previous section, the Censuses of Population and Housing of 1980 and 1990.

1. Individual characteristics

a. *Education.* The education of a population is often assessed in terms of *literacy*. How valid the equation of literacy with education depends on the definition of literacy. The definition used during the 1990 Census of the Philippines is a rather broad one requiring a bare minimum to qualify.[18] The 1990 Census of Population and Housing classifies some 2.85 million Filipinos 10 years and older as illiterate, which is 6.5 percent of the total population above 9 years of age. The proportion of illiterate females was slightly higher than that of males. Of importance is the fact that almost 80 percent of all illiterates in the country resided in rural areas.

The number of illiterates excludes a sizeable group of persons with hardly any education to speak of, as Table 9 suggests. Here were close to 30 million persons of age 20 or more in 1990, of whom 2.1 million were classified as illiterate by the Census. This number most probably excludes the vast majority of the 1.7 million who never finished grade 1 (no formal education) and a good portion of those with one to four years of elementary education only. Some 80 percent of those falling into the latter group are not older persons who grew up at a time when education was much less universal than was in 1990 but persons in the best ages between 20 and 45 born after World War II. Of the Philippine household population of 60.5 million enumerated by the census in May of 1990, 48.9 million were 7 years old or older, and 45.6 million (93

18. The 1990 Census of the Philippines defines a *literate* person as one who can "both read and write a simple message in any language or dialect. A person is considered *illiterate* if he can only read and write numbers or his own name or if he can read but not write." *1990 Census of Population and Housing, Definition of Terms and Concepts*.

TABLE 9. Persons 20 Years and Older, by Literacy

	Number	%
Population 20 years and older	29,924,752	100.0
Illiterate	2,108,820	7.7
No formal education	1,705,621	5.7
Pre-school only	33,905	0.1
1–4 years elementary education	4,860,076	16.2

SOURCE: 1990 Census of Population and Housing.

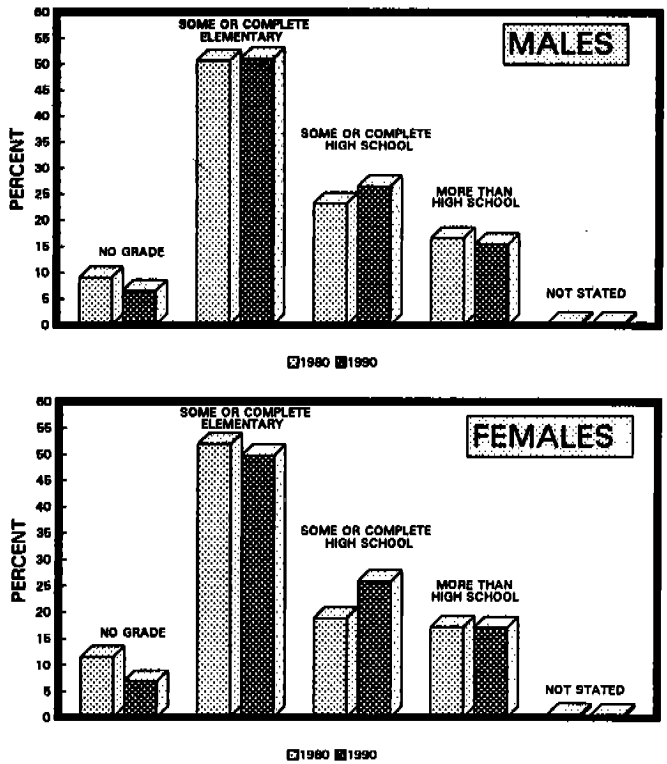
percent), had been in school during their lives and completed at least the first elementary grade. Gender differentials with respect to lifetime school attendance were insignificantly small.

During the 1980s, the overall educational situation in the country improved somewhat for both males and females. The proportion of all persons 7 years old and older who had never been to school declined from 10.3 percent in 1980 to 6.7 percent ten years later, and the proportion of women who had been enrolled in high school increased by 7 percent. With respect to people who had gone beyond high school, the situation in 1990 differed little from that in 1980 (Fig.19).

However, the *absolute* change with respect to educational attainment deserves some attention: Between the censuses of 1980 and 1990, persons with some or complete elementary education increased from 21.1 to 24.6 million; the number of those who had been to high school from 8.2 to 12.8 million, and those with more than high school from 4.5 to 7.8 million.

At the regional level, the proportions of all persons aged 7 and older who had completed at least pre-school or grade one did not differ widely as far as Luzon and the Visayas are concerned, NCR and the Cordillera excepted. The proportions of persons 7 years old and older with some education in the northern and central Philippine regions ranged from a high of about 97 percent in Central Luzon to 92.2 in Eastern Visayas. In Northern and Southern Mindanao, the two Mindanao regions with the largest urban centers in the country's south, the proportions of persons with a minimum of education were similar to those in Luzon and the Visayas. In Western and Central Mindanao together with ARMM, by contrast, the corresponding proportions were 10 percent lower. In the province of Maguindanao, only 68 percent of all persons 7 years old and older had completed any grade, and in Sulu, just 61 percent. The extent to which the regions with large minority

FIGURE 19. Educational Attainment of Persons 7 Years and Older, by Sex: Philippines, 1980 / 90



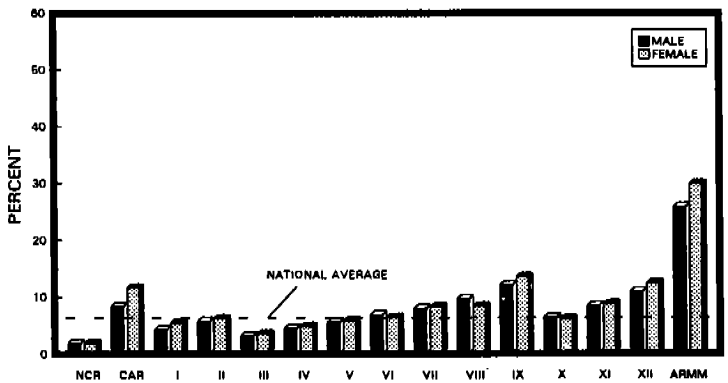
groups, especially ARMM, lagged behind the rest of the country in terms of the general educational level of its populace is illustrated in Fig. 20. The figure points out likewise that in regions and provinces with low educational attainment and large cultural minorities (CAR, Regions IX, XII, and ARRM), it is the women who were mostly disadvantaged in terms of education. In ARRM, the proportion of women above age 6 with no education was almost 5 percent larger than the corresponding proportion of males. In the province of Sulu, the difference between formally educated men and women amounted to 7 percent.[19]

b. *Work*. Most Philippine censuses since 1970 have included questions on the current work of individual household members.

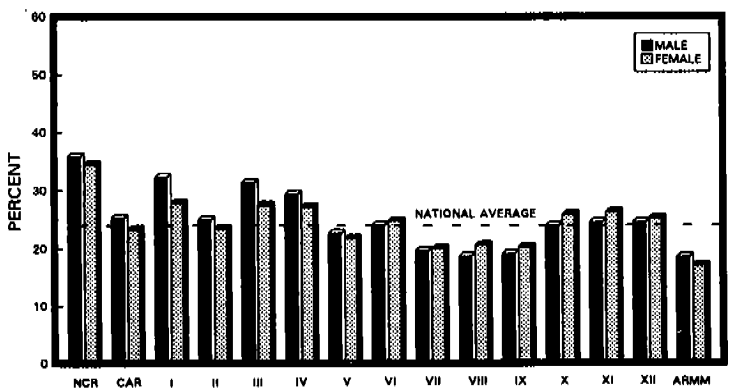
19. The corresponding census figures for Tawi-Tawi point to a much better educational situation in that island province than the rest of Muslim Mindanao. The correctness of these figures is doubtful.

FIGURE 20. Educational Attainment of Persons 7 Years Old and Older, by Region and Sex, 1990

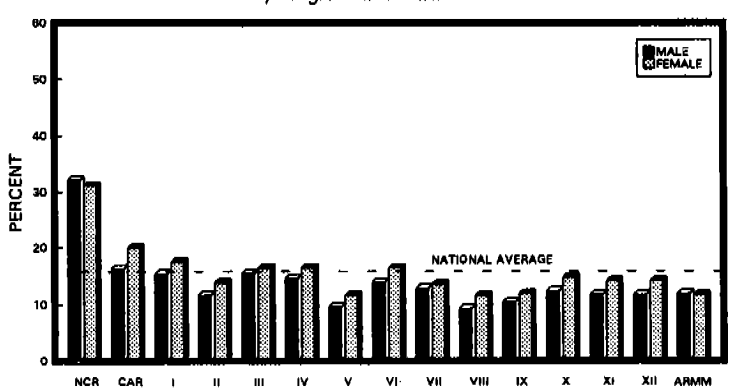
Population 7 Years and Older With No Formal Education, By Region and Sex: 1990



Population 7 Years and Older With High School Education, By Region and Sex: 1990



Population 7 Years and Older With College Education, By Region and Sex: 1990



Unfortunately, the items covered by these questions vary widely from one census to the next, and additional variability is introduced into the census publications through the manner in which information is coded and tabulated. For both of these types of variability, the last two censuses are prominent examples. Table 10, aside from providing basic labor force data, also illustrates the types of labor force information that can, and cannot be, extracted from the publications of the 1980 and 1990 censuses.

TABLE 10. Persons 15 Years Old and Older, by Labor Force Status: Philippines, 1980 and 1990

	1980			1990		
	Total	Urban	Rural	Total	Urban	Rural
POPULATION						
15 years old and older	27,734,739	10,982,522	16,752,217	36,572,398	18,564,263	18,008,135
Male	13,658,525	5,202,099	8,456,426	18,173,056	8,995,607	9,177,449
Female	14,076,214	5,780,423	8,295,791	18,399,342	9,568,656	8,830,686
IN THE						
LABOR FORCE*	14,173,685	5,724,204	8,449,481	21,106,645	10,964,306	10,142,339
Male	10,901,903	3,836,964	7,064,939	13,901,963	6,716,661	7,185,302
Female	3,271,782	1,887,240	1,384 542	7,204,682	4,247,645	2,957,037
EMPLOYED				19,318,191	10,111,066	9,207,125
Male				13,026,376	6,264,698	6,761,678
Female				6,291,815	3,846,368	2,445,447
UNEMPLOYED				1,788,454	853,240	935,214
Male				875,587	451,963	423,624
Female				912,867	401,277	511,590
NOT IN THE						
LABOR FORCE**	13,561,054	5,258,318	8,302,736	15,465,753	7,599,957	7,865,796
Male	2,756,622	1,365,135	1,391,487	4,271,093	2,278,946	1,992,147
Female	10,804,432	3,893,183	6,911,249	11,194,660	5,321,011	5,873,649

* Gainful occupation in the 1980 Census.
** Non-gainful occupation in the 1980 Census.

In the Philippines, the minimum age to legally join the work or *labor force* is 15. The censuses do not define an upper age limit terminating membership in the work force. Between 1980 and 1990, the Philippine population eligible for inclusion in the labor force (age 15 and older) increased by almost nine million, or 32 percent. The intercensal growth of this segment of the population was greater than that of the general population, which increased by "only" 26 percent. The growth of the country's potential work force in urban areas outpaced that in rural

areas by a factor of 6. However, this disproportional growth of the urban labor force is in part an artifact brought about by the recent reclassification of barangays from rural to urban.

Still faster than the growth of the potential labor force (population 15 years old and older) between 1980 and 1990 was that of the actual labor force. The latter is composed of all persons actually holding a job (employed) or looking for one (unemployed). For both sexes combined, this growth amounted to 36 percent (seven million persons). The main contributor to this growth in both absolute and relative terms was the women who, between 1980 and 1990, added four million members to the work force, which is one million more than the number of males added. Despite this rapid growth of the female labor force during the 1980s, the number of female workers in 1990 was just half the number of male workers (7.2 vs. 13.9 million).

Participation in actual work is usually measured in terms of the *labor force participation rate*, which is the proportion of persons eligible to join the work force who actually have joined. The rate of 57.7 in Table 11 states that, of all persons eligible for the labor force in 1990, 57 percent were holding a job. The extraordinary growth during the 1980s of the female labor force is also reflected in the female labor force participation rate. For males, labor force participation had remained stable during the same period.

The labor force is composed of all persons 15 years old and older who actually hold a job (employed) plus those who do not but are actively looking for one (unemployed). The proportion of persons aged 15 years and older not having but looking for a job is the unemployment rate. The 1990 rates listed in Table 11 show that, at that time, female unemployment outpaced male unemployment by a factor of 2.

TABLE 11. Labor Force Statistics: Philippines, 1980 and 1990

Parameter	1980			1990		
	Total	Urban	Rural	Total	Urban	Rural
LABOR FORCE PARTICIPATION RATE						
Both Sexes	51.1	52.1	50.4	57.7	59.1	56.3
Male	76.9	73.8	83.5	76.5	74.7	78.3
Female	23.2	32.6	16.7	39.2	44.4	33.5
UNEMPLOYMENT RATE						
Both Sexes				8.5	7.8	9.2
Male				6.3	6.7	5.9
Female				12.7	9.4	17.3

Table 12 illustrates, aside from regional unemployment, the extent to which female unemployment in some parts of the country in 1990 exceeded male unemployment.

TABLE 12. Unemployment Rates, by Region and Sex: Philippines, 1990

Region	Both Sexes	Male	Female
PHILIPPINES	**8.5**	**6.3**	**12.7**
National Capital Region	6.3	6.2	6.5
Cordillera	5.2	4.3	6.5
Ilocos	11.1	7.7	18.7
Cagayan	10.3	6.8	18.4
Central Luzon	9.4	7.8	13.1
Southern Tagalog	7.7	6.0	11.8
Bicol	6.3	3.8	12.7
Western Visayas	1.7	8.4	18.7
Central Visayas	8.0	6.6	10.0
Eastern Visayas	10.4	6.1	20.8
Western Mindanao[1]	9.6	7.0	14.6
Northern Mindanao	8.1	5.6	13.1
Southern Mindanao	9.9	6.6	17.2
Central Mindanao[2]	6.4	2.6	15.3

[1] includes Sulu and Tawi -Tawi
[2] includes Lanao del Sur and Maguindanao

The regions with the highest overall unemployment in the country were Western Visayas and the Ilocos. In both these regions, there exist above average male unemployment and very high female unemployment, the latter exceeding the national average by 50 percent. In two other regions, Cagayan Valley and Eastern Visayas, it was the extremely high female unemployment rate that kept the overall regional rates high. Highest female unemployment in the country, affecting every fifth woman in the regional labor force, was registered in Eastern Visayas.

Unemployment tends to be high for those seeking first jobs (labor force entrants). The majority of new entrants is between 15 and 24 years old. By contrast, the experienced labor force, i.e., persons with job experience, tend to have less difficulty finding a job. Table 13 divides the labor force into persons 15-24 years of age, and persons 25 years old or older and presents unemployment rates for these two groups of the labor force.

For young people without job experience, unemployment rates were two to three times as high as the rates for experienced workers. For both groups of workers, those below and above 25, the same

patterns shown in Table 10 appear: unemployment of women is usually higher than that of men, and while employment for men is easier to find in rural areas, women tend to have an easier time obtaining a job in urban areas.

TABLE 13. Unemployment Rates for Persons 15–24 Years of Age and 25 Years Old and Older, by Stratum and Sex, 1990

Population	15–24 Years Old			25 Years and Older		
	Total	Urban	Rural	Total	Urban	Rural
Total population	**14.8**	**14.7**	**15.0**	**6.1**	**5.4**	**6.9**
Male	12.7	14.6	11.3	4.2	4.5	3.9
Female	18.0	14.8	22.1	10.2	7.1	14.9

In the NCR, unemployment levels in 1990 were below the urban national averages of 12.7 for males and 18.0 for females: 12.1 percent for men aged 15-24, and 9.6 percent for women of the same age. In the Western and Central Visayas regions, unemployment not only of young workers but in general was relatively high in the provinces of Iloilo and Negros Occidental. In Mindanao, the province of Davao del Sur with Davao City together with the provinces of Zamboanga del Norte and Surigao del Sur, registered the highest unemployment rates of young labor force members in the country's south.

Finding a job depends largely on the skills a person has to offer and on the current demand for those skills. No published tabulations exist classifying the unemployed by type of skills they had to offer (occupation) or the type of job they were looking for. What the last two censuses show is the number of persons aged 15 and older with gainful occupations: 14 million in 1980, and 21 million in 1990.

The occupational classifications used in the census tabulations of 1990 differ considerably from those of 1990 and make it difficult to assess shifts in the occupational structure of the labor force that occurred between 1980 and 1990. The only occupational group defined in identical terms in 1980 and 1990 is that of farmers, fishers and forest workers.

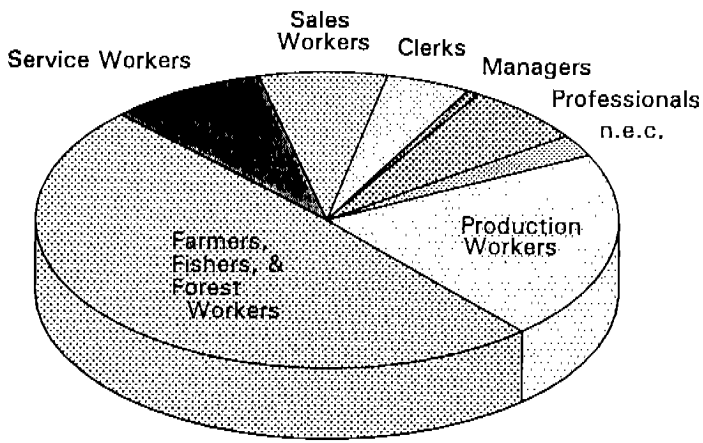
Between 1980 and 1990, the number of farmers, fishers and forest workers declined by 380,000. Of the latter, 93 percent were males. The proportion that the farmers, fishers and forest workers represented of all persons aged 15 and older with a gainful occupation likewise

TABLE 14. Persons 15 Years Old and Older with Gainful Occupation, by Occupation and Sex: Philippines, 1980 (In percent)

Occupation	Both Sexes	Male	Female
All Workers (in 000s)	**14,173**	**10,901**	**3,271**
Professional/Technical	6.6	3.5	17.0
Administrative/Managers	0.7	0.8	0.6
Clerical Workers	4.7	3.2	9.6
Sales Workers	7.1	4.7	15.4
Service Workers	8.7	4.8	21.7
Farmers/Fishers	49.2	58.8	17.1
Production Workers	20.6	21.9	16.2
Occupations n.e.c.	2.4	2.3	2.4

N.E.C. - not elsewhere classified

FIGURE 21. Gainful Workers 15 Years Old and Older, by Occupation: Philippines, 1980



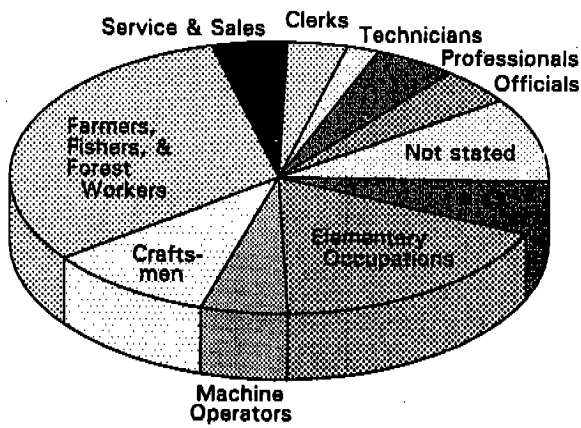
shrunk: from 50 percent in 1980 to just a little over 30 percent in 1990, a rather substantial shift indicating a significant restructuring of the Philippine occupational structure.

Of the 6.6 million persons with gainful farm-related occupations in 1990, not all were actually working (number of unemployed farmers, fishers and forestry workers unknown), and of those who were, not all worked in the agricultural sector; some 80,000 of them performed jobs in other sectors of the economy. On the other hand, the labor force in the agricultural sector in 1990 included 1.5 million persons with non-farm related occupations, the vast majority of which is classified as *elementary occupations*. According to the 1990 Census publications, persons with elementary occupations in the agri-cultural sector

TABLE 15. Persons 15 Years Old and Older with Gainful Occupation, by Occupation and Sex, 1990 (In percent)

Occupation	Both Sexes	Male	Female
All Workers (in 000s)	**21,098**	**14,731**	**6,367**
Officials/Managers	4.4	3.7	5.8
Professionals	4.9	2.6	10.4
Technicians	1.9	1.7	2.2
Clerks	3.6	2.0	7.3
Service/Sales	4.5	3.6	6.6
Farmers/Fishers	31.2	41.1	8.4
Craftsmen	10.1	10.8	8.1
Machine operators	5.2	7.0	.1.0
Elementary Occupation	17.8	14.6	25.4
Occupations n.e.c.	6.3	6.1	7.1
Not Stated	10.1	6.8	17.7

FIGURE 22. Gainful Workers 15 Years Old and Older, by Occupation, 1990



included, aside from domestic helpers, market and street vendors, watchers and even garbage collectors.

In 1990, 20 percent of all farmers, fishers and forest workers resided in urban areas, an increase of half a million over such urban workers in 1980. The primary reason for this increase in urban agricultural workers is the reclassification of 2,461 barangays with their predominantly agricultural labor forces from rural in 1980 to urban in 1990, not any phenomenal growth of the urban agricultural labor force through natural increase or in-migration.

TABLE 16. Number and Percent of Farmers. Fishers and Forest Workers: Philippines, 1980, 1990, and Change 1980–90:

Agricultural Labor Force	1980		1990		Change 1980-90	
	Number	% of L.F.[1]	Number	% of L.F	Number	% of L.F.
BOTH SEXES						
Gainfully employed farmers, fishers, and forest workers	6,969,013	49.2	6,589,176	31.2	-379,837	-18.0
MALE						
Gainfully employed farmers, fishers, and forest workers	6,408,627	58.8	6,055,725	41.1	-352,902	-17.7
FEMALE						
Gainfully employed farmers, fishers, and forest workers	560,386	17.1	533,451	8.4	-26,935	-8.7

[1] Labor Force.

In all regions of the country, NCR excepted, farmers, fishers and forestry workers represented the bulk of all persons aged 15 and older who reported a gainful occupation. The proportions of persons with farm occupations among all persons with gainful occupations ranged from approximately one half in the provinces of northern Luzon, the Eastern Visayas and all of Mindanao, over one third in the provinces of Western and Central Visayas, to about one fourth in the provinces of Central Luzon and Southern Tagalog. In the NCR, the industrial and commercial hub of the country, farmers, fishers and forest workers accounted for less than 1 percent of all persons with a gainful occupation.

The second-largest occupational group in the Philippines in 1990, numbering 3.8 million, consisted of people with *elementary* occupations. One third of them (34.6 percent) are classified as "Agricultural, Forestry and Fishery Laborers," 24 percent as "Domestic Helpers and Cleaners," and an equal proportion as "Market Stall and Street Vendors." The remainder are laborers in construction, transportation and mining, shoe cleaners, window washers, messengers, and garbage collectors. None of these elementary occupations requires much in terms of training, and none commands much pay. Many people holding elementary jobs are self-employed and perform the job because no other job is available. Excessively large proportions of persons with elementary occupations lived in Cagayan Valley, Bicol, Western and Eastern Visayas, and Southern Mindanao. In Western Visayas alone, they numbered 520,000 and accounted for

more than 30 percent of all persons aged 15 and older in that region with a gainful occupation.

Close to half a million persons (485,348) reported teaching as their occupation, two thirds of them urban residents. Seventy percent of all teachers worked in elementary schools, nearly 20 percent were high school teachers, and 6.7 percent instructed in colleges and universities.[20]

Available *industry* data from the 1980 and 1990 censuses permit not only to outline the economic sectors in which people were working during both census years but also to delineate the changes that the country's economy has undergone between 1980 and 1990. This delineation is possible because the census definitions of the industrial sectors has remained unchanged since 1980.[21]

Table 17 displays the number of persons with a gainful occupation for each sector of the country's economy for the years 1980 and 1990, the percentage of all such persons in each industrial sector, and the 1980–90 change in the number of such persons in each sector. In all industry sectors, the number of persons with a gainful occupation rose during the 1980s. The sector with the least increase in work force was agriculture whose labor force grew by only 9 percent. As stated earlier, this expansion occurred not through the addition of farmers or fishers (whose number had declined) but of persons with elementary occupations.

While agriculture was still the country's largest sector in 1990 with the largest number of workers, it offered work to only 38 percent of the labor force, down from more than 50 percent ten years earlier. Services, both communal and personal, had remained the second largest sector during the 1980s, but despite an addition of 850,000 jobs, its share of the country's total labor force had likewise declined, though only slightly. The largest creator of new jobs during the 1980s was the wholesale and retail trade, In terms of job creation during the intercensal period, the manufacturing sector ranked a distant fourth, after sales, services, and (even) agriculture.[22]

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20. The remaining 4 percent were instructors in technical and vocational schools, special education teachers, and unnamed teaching professionals.

21. The 1980 census tabulations provide breakdowns of the labor force in the various industrial sectors by sex, age, marital status, occupation and stratum, but not region; the 1990 Census provides a breakdown only by occupation and region.

22. The figures in Table 17 refer to all persons 15 years old and older who reported a gainful occupation in 1980 and 1990. Included in this group are the unemployed. In contrast to the 1990 Census, that of 1980 does not provide a breakdown of the gainfully employed into those actually working and those unemployed. For 1990, figures of the actually working are shown in Table 18.

TABLE 17. Persons 15 Years Old and Older with Gainful Occupations, by Industry: Philippines, 1980 and 1990

Industry	1980		1990		1980–90 % change in # of persons with gainful occupations
	Number	%	Number	%	
All industries	**14,173,685**	**100.0**	**21,098,067**	**100.0**	**+ 48.9**
Agriculture, Fishery, and Forestry	7,295,113	51.5	7,947,131	37.7	+ 8.9
Mining and Quarrying	84,579	0.6	124,623	0.6	+ 47.3
Manufacturing	1,369,799	9.7	1,873,628	8.9	+ 36.8
Electricity, Gas and Water	64,188	0.4	74,352	0.4	+ 15.8
Construction	634,818	4.5	936,013	4.4	+ 47.4
Wholesale and Retail	986,789	6.9	2,054,286	9.7	+ 108.2
Transport and Communication	787,848	5.6	1,095,797	5.2	+ 39.1
Financing, Insurance, Real Estate, and Business Services	397,137	2.8	459,674	2.2	+ 15.7
Community, Social and Personal Services	2,388,062	16.8	3,256,754	15.4	+ 36.4
Activities not adequately defined	165,352	1.2	1,701,232	8.1	
Not stated			1,574,577	7.4	

The ranking of the industrial groupings in terms of labor force size in 1990 was basically the same as that of 1980, with one exception: the sales industry, fourth largest provider of jobs in 1980, had exchanged places with manufacturing, the third largest job provider in 1980.

In 1990, agriculture was still the predominant economic sector in every region, with the exception of the NCR. In most regions, agriculture and fishing accounted for more than 50 percent of all economic activities. Exceptions, aside from NCR, were Central Luzon, Southern Tagalog and Central Visayas. These regions were the centers of manufacturing, wholesale and retail trade, as well as of transportation and communication-related activities. The bulk of the country's mining industry was concentrated in the Cordillera, and banking and finance together with services in the NCR.

The 1990 Census provides information not only for all persons aged 15 and older with a gainful occupation per industry sector but also for people who actually were working in each sector in 1990 (Table 18). Ideally, the subtraction of the latter set of figures from the figures of the first set should yield the number of unemployed persons per sector. Unfortunately, 29 percent of all unemployed persons could not be classified according to industry.

Despite the just mentioned deficiency, Table 18 supplies some approximate figures related to unemployment. Agriculture and fishing, taken together, accounted for about one half of the unemployed in the country.The proportion of the unemployed in the agricultural sector was twice as high as in the construction and service industries, the economic sectors with the second-highest unemployment rates in 1990 (5.5 percent). In terms of job permanency, manufacturing and trade offered the most secure jobs.

2. Household characteristics

a. Number and size of households. During the 1980s, the number of private households in the country increased by 32.5 percent, from 8,6 million in 1980 to 11,4 million a decade later. This increase was slower than the corresponding increase a decade earlier (1970-80), when it amounted to 40 percent.

The rapid increase in the number of *urban* households from 1980 to 1990 and the stagnating number of *rural* households over the same time span are largely artifacts brought about by the reclassification of barangays from rural to urban.

TABLE 18. Persons 15 Years Old and Older with Gainful Occupations, Actually Working, and Unemployed, by Industry: Philippines, 1990

Industry	Persons 15 Years & older with gainful occ.		Persons 15 Years & older actually working		Persons 15 Years & older unemployed	
	Number	%	Number	%	Number	% in Sector
ALL INDUSTRIES	**21,098,067**	**100.0**	**19,318,191**	**100.0**	**1,779,876**	**8.5**
Agriculture, Fishery and Forestry	7,947,131	37.7	7,085,626	36.7	861,505	10.8
Mining and Quarrying	124,623	0.6	118,112	0.6	6,511	5.2
Manufacturing	1,873,628	8.9	1,835,311	9.5	38,317	2.0
Electricity, Gas and Water	74,352	0.4	71,325	0.4	3,027	4.1
Construction	936,013	4.4	884,654	4.6	51,359	5.5
Wholesale & Retail	2,054,286	9.7	1,999,447	10.4	54,839	2.7
Transport & Communication	1,095,797	5.	2 1,040,971	5.4	54,826	5.0
Financing, Insurance, Real Estate, and Business Services	459,674	2.2	439,928	2.3	19,746	4.3
Community, Social and Personal Services	3,256,754	15.4	3,079,290	15.9	177,464	5.4
Activities not adequately defined	1,701,232	8.1	839,497	4.3	861,735	50.7
Not stated	1,574,577	7.4	1,924,030	9.9	(349,435)	(19.6)

In the 1990 Census, persons were reported as gainful workers if they had worked most of the *12 months* preceding the census; they were reported as actually working if they had worked during the *week* preceding the census.

Average household size in the Philippines has been on a decline since 1970s. At the time 1970 Census, average household size was 5.9 persons per households, in 1980, it had declined to 5.6, and ten years later to 5.3. This decline is definitely related to the decline of the total rate and perhaps also to an earlier break-away of young persons, single or newly married, from their households of origin.

As shown in Table 20, average household size differed relatively little from one region to the next: by a maximum of 0.4 persons in 1980, and of 0.5 persons in 1990. Regions that, relatively speaking, had large or small average household sizes in 1980 also had large or small households ten years later, only at slightly reduced levels. The regions with the largest households were the Mindanao regions, together with Western Visayas and Bicol.

TABLE 19. Number of Households, by Stratum: Philipines, 1980 and 1990

	1980		1990	
	Number	%	Number	%
All Households	8,607,187	100.0	11,407,262	100.0
Urban Households	3,219,107	37.4	5,582,639	48.9
Rural Households	5,388,080	62.6	5,824,623	51.1

TABLE 20. Number of Households, Average Household Size and Increase in the Number of Households: Philippines, 1980 and 1990 (Increase in percent)

Region	1980		1990		1980–1990 Growth	
	# of HHLDs	Ave. Size	# of HHLDs	Ave. Size	HHLDs	Population
PHILIPPINES	**8,607,187**	**5.6**	**11,407,262**	**5.3**	**32.5**	**26.9**
Nat. Capital Region	1,103,563	5.4	1,569,588	5.0	42.2	33.4
CAR/Ilocos/Cagayan	1,055,107	5.5	1,325,591	5.3	25.6	22.0
Central Luzon	838,045	5.7	1,163,205	5.3	38.8	28.9
Southern Tagalog	1,107,031	5.5	1,583,682	5.2	43.1	34.8
Bicol	603,807	5.8	708,802	5.5	17.4	12.3
Western Visayas	786,881	5.8	985,274	5.5	25.2	19.0
Central Visayas	698,105	5.4	873,843	5.2	25.2	21.0
Eastern Visayas	511,107	5.5	584,964	5.2	14.5	8.9
Western Mindanao	438,878	5.8	577,837	5.5	31.7	24.6
Northern Mindanao	479,504	5.8	639,108	5.5	33.3	27.0
Southern Mindanao	591,896	5.7	823,316	5.4	39.1	32.9
Central Mindanao	393,263	5.8	572,052	5.5	45.5	39.5

Western Mindanao includes the provinces of Sulu and Tawi-Tawi, and Central Mindanao includes the provinces of Lanao del Sur and Maguindanao.

Single-person and two-person households are still the exception in the Philippines. In 1990, they together accounted for just 11 percent of all private households; single-person households alone for barely 3 percent. The region with the largest proportion of single-person households was. somewhat surprisingly, CAR, with more than 6 percent of such households. Regions with the smallest proportions of one- and two-member households were Western and Central Mindanao, both of which contain large Muslim populations. Almost one half of all households in the country in 1990 consisted of four, five or six members, and approximately every sixth household had eight or more members. The largest proportions of comparatively large households were found in Bicol and the Mindanao regions.

In 1990, differences in household size between urban and rural areas were not particularly large when individual size categories are compared (Table 21). In almost all of the country's regions, small households tended to be more frequent in urban places, while larger households, especially those with eight or more members, were more common in rural areas.

TABLE 21. Private Households, by Number of Members, Stratum and Region: Philippines, 1990 (In percent)

Region	Number of Households	Number of Household Members							
		1	2	3	4	5	6	7	8+
PHILIPPINES (URBAN)	**5,682,639**	**2.9**	**8.0**	**13.2**	**17.7**	**18.1**	**15.0**	**10.4**	**14.7**
National Capital Region	1,569,588	2.8	8.6	14.7	19.1	19.0	14.9	9.5	11.5
Cordillera	70,360	6.8	9.3	12.4	15.8	16.7	14.6	10.3	14.0
Ilocos	246,020	3.4	8.2	11.8	16.2	16.5	14.6	11.0	18.2
Cagayan Valley	103,210	2.5	7.8	12.6	16.9	18.6	15.4	10.8	15.4
Central Luzon	708,504	2.8	7.6	12.8	17.7	18.5	15.3	10.5	14.7
Southern Tagalog	815,037	2.7	7.9	13.5	18.3	19.2	15.3	10.1	13.0
Bicol	221,136	2.9	7.5	11.5	15.4	16.3	15.4	12.2	18.8
Western Visayas	349,236	3.1	7.3	12.4	15.9	17.2	14.9	11.3	18.0
Central Visayas	345,780	3.5	8.6	12.8	17.4	17.2	14.0	10.5	16.0
Eastern Visayas	175,354	3.8	8.7	13.0	15.6	16.4	14.4	11.1	17.0
Western Mindanao	174,041	2.2	7.2	12.7	17.4	17.1	14.9	11.3	17.0
Northern Mindanao	274,000	2.7	7.2	12.0	16.6	16.8	15.2	11.1	18.4
Southern Mindanao	389,280	2.7	7.5	12.6	17.2	17.4	15.3	10.9	16.4
Central Mindanao	141,093	1.9	7.1	12.3	17.4	16.5	13.9	11.2	19.6
PHILIPPINES (RURAL)	**5,824,623**	**3.0**	**8.5**	**12.9**	**16.5**	**16.7**	**14.4**	**11.0**	**17.2**
Cordillera	148,989	6.0	8.7	12.0	14.7	15.7	14.0	11.3	17.7
Ilocos	413,383	3.5	8.3	11.9	16.0	17.2	14.7	11.3	17.2
Cagayan Valley	343,629	2.2	7.5	13.1	18.2	18.7	14.9	10.9	14.4
Central Luzon	454,701	2.2	7.4	12.0	17.1	18.4	15.5	11.1	16.3
Southern Tagalog	768,645	3.2	8.8	13.2	16.7	17.2	14.5	10.7	15.6
Bicol	487,666	2.6	8.1	12.1	15.6	15.7	14.5	11.7	19.8
Western Visayas	636,038	3.3	8.7	12.6	15.6	15.8	13.8	11.3	18.9
Central Visayas	528,063	4.3	10.4	13.7	16.3	16.0	13.6	10.2	15.5
Eastern Visayas	409,610	3.7	9.9	13.7	16.0	16.0	13.7	10.6	16.4
Western Mindanao	403,796	1.8	7.3	12.8	17.7	17.5	14.6	11.2	17.1
Northern Mindanao	365,108	2.6	8.0	12.6	16.2	16.1	14.3	11.3	18.8
Southern Mindanao	434,036	2.8	8.7	13.3	16.8	16.1	14.2	10.8	17.4
Central Mindanao	430,959	1.5	7.5	13.2	16.7	16.3	14.4	11.3	19.1

Western Mindanao includes the provinces of Sulu and Tawi-Tawi, and Central Mindanao includes the provinces of Lanao del Sur and Maguindanao.

b. Household composition. The term "household composition" refers to a number of household characteristics. The most commonly used criterion for defining household composition is the relationship household members have to one another. A young couple, with or without small children and living in a house or apartment, constitutes a *nuclear family household*. The same couple, living with the parents of either spouse forms, together with the family of the parents, a *multi-family* household. Nuclear families may be extended by having as household members brothers and sisters or cousins (horizontal extension) or father or mother or grandparent or uncle or aunt of either or both spouses of a nuclear family (vertical extension). Households may be, at the same time, horizontally *and* vertically extended and/or contain in addition members not related to anyone of the family nucleus in the household.

In 1990, three fourths of all Philippine households contained one nuclear family without extensions of any type. The highest proportions of nuclear family households, more than 80 percent of all households, were found in the provinces of Muslim Mindanao and some provinces of the Cordillera region; the small island province of Siquijor had the smallest proportion of such households, at 64 percent.

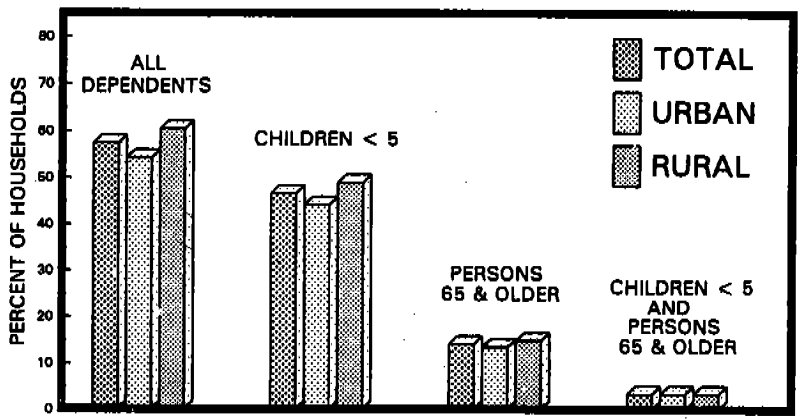
The most common form of family extension found in Filipino households in 1990 was the vertical extension, containing either members of the household head/parent generation and/or the generation of the head's children or grandchildren. Such households accounted for 16 percent of all households in 1990. By contrast, horizontally extended family households were rare: less than 3 percent of all households.

Close to 700,000 vertically extended households were multi-family households, containing sons-in-law or daughters-in-law with their children. The next most frequent vertical family extensions, by order of magnitude, were nieces and nephews, and parents of household heads. In instances in which only one parent of the household head was present, the probability that it was the mother of the head was three times as large as the probability that it was the father. Brothers and/or sisters of household heads were the most common horizontal family extensions.

From an economic point of view, the age composition of the household members is of importance: how many household members are of working age and economically active and supporting eventually present children and aged members. The number of economically active persons in the household determines the household income and, with it, the household's life style.

At the time of the 1990 Census, more than one half of all households in the country (57 percent) contained dependents, the latter defined as children under 5 years old and elderly persons aged 65 and over. The majority of these dependents were young children, found in 50 percent of all households. The proportion of households containing elderly dependents was less than one in seven. Just 3 percent of all households contained both young and old dependents. The proportion of rural households with dependents, both old and young, was somewhat larger than the proportion among urban households.

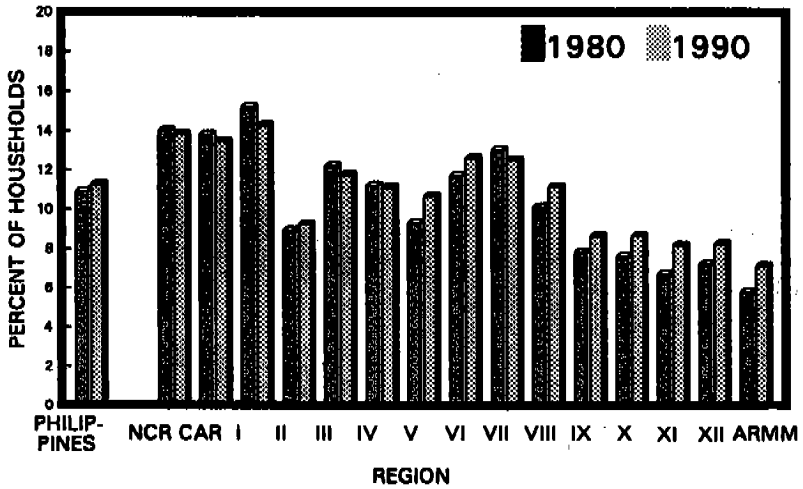
FIGURE 23. Percent of Households with Dependents, by Type of Dependents and Stratum: Philippines, 1990



Among the country's regions and provinces, NCR had the largest proportion of households without any dependents: 50 percent. The primary reason for this cannot be the existence of single- and two-person households in the Metro Area because such households were more prevalent in other areas of the country; the main reason must be related to the comparatively low fertility level in and around Manila in general, as well as delayed fertility among young career-oriented couples residing in NCR. In 1990, no clear geographic patterns were discernable.

The majority of all households has a male household head; only 11 percent in 1990 (1.3 million) were headed by a woman. The largest proportions of households with female heads in 1990 were found in the Ilocos, the NCR and the Cordillera provinces; the smallest proportions were in Mindanao. The absolutely smallest proportions of

FIGURE 24. Percent of Female-headed Households, by Region: Philippines, 1980 and 1990



female-headed households existed in areas with large Muslim populations. Regions in Luzon and the Visayas with large urban centers, such as Central Luzon, Southern Tagalog and Western and Central Visayas, had larger proportions of woman-headed households than the predominantly agricultural regions.

During the 1980s, the proportion of female-headed households had remained stable: the 1980 Census reported 10.9 percent of such households nationwide. During the same period, the Ilocos Region and Central Visayas registered a slight decline of households with female heads, while all Mindanao regions reported a slight increase.

c. *Housing*. The living quarters occupied by a household are among the best indicators of a household's economic status. In combination with household facilities, they provide a good proxi measure of household wealth. Philippine censuses provide information on housing quality (construction materials of walls, roofing and flooring), residential crowding (floor space per household member), and household facilities. With respect to *housing quality*, the information of the 1990 Census permits to divide dwelling units into constructions of (1) solid materials, (2) semi-solid materials, (3) intermediate type constructions, i.e., mixtures of solid and semi-solid materials, and (4) makeshift constructions. Solid materials include concrete, bricks, stones, wood and galvanized iron for walls, and

galvanized iron, tiles (concrete or clay) and wood for roofs. Semi-solid materials are bamboo, sawali, cogon, nipa, and anahaw. Makeshift buildings are entirely put together from salvaged materials of all kinds, including cardboard and jute.

In 1990, approximately 50 percent of all dwellings were of solid construction, 30 percent of semi-solid, and about 20 percent of an intermediate type. As Table 22 shows, urban rural differences in housing quality were considerable. Likewise considerable in 1990 were regional differences. Table 23 lists, by region, the percentage of all dwelling units in 1990 constructed from solid materials.

TABLE 22. Percent of Dwelling Units, by Type of Construction and Stratum: Philippines, 1990

Stratum	Type of construction			
	Solid	Semi-solid	Intermediate	Make shift
All Strata	**51.3**	**28.9**	**19.1**	**0.7**
Urban Areas	70.8	14.1	14.1	1.0
Rural Areas	32.5	43.3	23.8	0.4

In terms of solidly constructed dwelling units, Bicol, the entire Visayas and Western Mindanao were trailing all other regions. The high proportions of households with good housing in the Cordillera and the southern part of Mindanao indicated in Table 23 appear somewhat doubtful in view of the overall economic situation in these parts of the country.

The least adequate housing, aside from no housing at all, is shacks constructed entirely from scrap materials. Nationwide in 1990, some 0.7 percent of all Filipino households (about 81,000) lived in such huts. Makeshift huts are primarily an urban phenomenon. The proportion of urban households crowded into makeshift housing (1 percent) was more than two times as large as the corresponding rural proportion. Detailed figures show that makeshift housing predominated in regions with large urban population.

Provinces with relatively large numbers of makeshift dwellings in 1990 were those containing sizeable urban centers or located in the vicinity of Metro Manila. In Rizal province, 1.4 percent of all dwellings were makeshift, in Cebu Province, 1.2 percent, in Cavite, 0.8 percent, and in Bulacan, 0.7 percent. However, makeshift dwellings in

TABLE 23. Percent of Households Living in Solidly Constructed Dwelling Units, by Region and Stratum: Philippines, 1990

Region / Province	Total	Urban	Rural
PHILIPPINES	**51.3**	**70.8**	**32.5**
National Capital Region	93.9	93.9	n.a.
Cordillera (CAR)	62.2	87.8	57.5
Ilocos (I)	53.4	61.6	48.4
Cagayan Valley (II)	40.2	60.1	34.2
Central Luzon (III)	68.3	80.1	53.8
South. Tagalog (IV)	58.2	75.8	39.9
Bicol (V)	24.9	38.5	18.6
Western Visayas (VI)	26.6	43.5	17.3
Central Visayas (VII)	38.1	52.6	28.6
Eastern Visayas (VIII)	24.6	34.5	20.2
Western Mindanao (IX)	27.7	44.7	18.8
North. Mindanao (X)	43.4	52.5	36.5
South. Mindanao (XI)	49.0	62.8	36.4
Central Mindanao (XII)	36.4	53.8	31.1
Muslim Mindanao (ARMM)	34.9	51.8	29.6

comparatively large numbers existed likewise in relatively undeveloped rural provinces such as Masbate (2 percent of all dwellings), Basilan (1.5 percent), Romblon (1 percent), Surigao del Sur (0.9 percent), and Palawan (0.8 percent). In Cebu province, makeshift dwellings were concentrated not only in Metro Cebu, as indicated earlier, but also in the remainder of the province, where 1.5 percent of all dwellings were built exclusively of scrap materials.

FIGURE 25. Percent of Households Living in Makeshift Dwellings, by Stratum and Region: Philippines, 1990

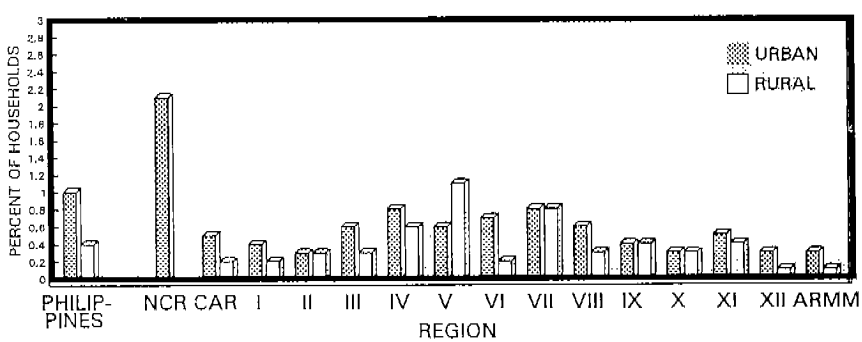


TABLE 24. Households Living in Makeshift Dwellings: NCR, 1990 (In percent)

Administrative Unit	Percent	Administrative Unit	Percent
NATIONAL CAPITAL REGION	2.1		
Caloocan	2.0	Paranaque	3.3
Las Pinas	2.3	Pasay City	2.5
Makati	1.3	Pasig	0.9
Malabon	1.7	Pateros	1.5
Mandaluyong	1.2	Quezon City	2.7
Manila City	2.4	San Juan	1.0
Marikina	1.1	Taguig	1.5
Muntinlupa	1.3	Valenzuela	1.1
Navotas	5.0		

Within Metro Manila, makeshift (slum and squatter) housing was concentrated in Navotas, Parañaque, Quezon City, Pasay City, and Manila proper.

Residential crowding has long been recognized as an acute health threat. Overcrowded quarters forcing the inhabitants to cook, eat and sleep in the same room or to keep animals where water is stored and food is cooked make personal hygiene difficult or impossible. The 1990 Census contains information on the average amount of housing space (floor area in square meters) available per household member. Most of this information was obtained not through actual measurements of residential floor space but through estimates based on ocular inspections of dwelling units by the census enumerators. This rough measurement most likely accounts for a good amount of the provincial variations documented in the census reports.

The average urban dweller in 1990 had an average living space of nine square meters, while rural dwellers had an average of just a little more than five square meters. This urban-rural difference, though varying in size, existed throughout the country, as Appendix Table A8 documents. The table lists, separately for urban and rural households in all provinces, the average provincial floor space per household member.

If floor space is equated with housing comfort and taken as a rough proxy of household hygiene, then housing conditions in 1990 were best in the highly urbanized provinces of Central Luzon, the provinces bordering Metro Manila, and some parts of Central Visayas; they were of comparatively low quality in Bicol, on the Island of Samar and in most of Mindanao. At the provincial level, residential crowding was very

high (less than four square meters per household member) in rural Ifugao, rural Northern Samar, rural Negros Oriental, and rural Davao Oriental. Additional factors in these as well as other rural areas that add to the health hazards resulting from overcrowding is the absence of healthy water sources and water storage facilities, of sanitary facilities, and of appropriate garbage disposal, to name only a few. Poor rural housing conditions are replicated in even worse form in urban slum and squatter areas, where makeshift housing predominates and where in-house crowding is exacerbated by the crowding of large numbers of small houses and huts into usually extremely small geographic areas.

d. *Household fuel.* Households need energy for lighting and cooking purposes. With respect to *lighting*, the country has embarked on an electrification program for a number of decades. At the time of the 1990 Census, some 55 percent of all households used electricity for lighting. This proportion represents an increase of 17 percent over 1980. In terms of absolute numbers, electricity-using households doubled: from 3,217,000 in 1980 to 6,283,000 in 1990.

TABLE 25. Households Using Electricity Lighting Fuel, by Stratum: Philippines, 1980 and 1990

	1980		1990		1980–1990
	Number	%	Number	%	Percent change
PHILIPPINES	**3,217,726**	**37.4**	**6,283,256**	**55.1**	**+ 17.7**
Urban	2,295,203	71.3	4,423,250	79.2	+ 7.9
Rural	922,523	17.1	1,860,006	31.9	+ 14.8

What happened to the country as a whole happened in equal measure in urban and rural areas: the number of households using electricity doubled in both strata during the 1980s. From a development point of view, the most important fact brought out in Table 25 is the declining urban-rural gap in the proportion of electrified households by some 7 percent: in 1980, this gap amounted to 54 percent, and in 1990, to 47 percent.

The only other energy source of importance, used for lighting purpposes, is kerosene. In 1990, it was still used by more than 40 percent of all households, three-fourths of them located in rural barangays. Ten years earlier, kerosene had been the predominantly

utilized household lighting fuel, used in 60 percent of all households (Fig. 26). Rarely used sources of energy for lighting, employed almost exclusively in rural areas, were LPG (used by 1.9 percent of all households in 1990), oil (0.1 percent), and others (0.7 percent).

FIGURE 26. Type of Fuel Used by Households for Lighting: Philippines, 1980 and 1990 (In percent)

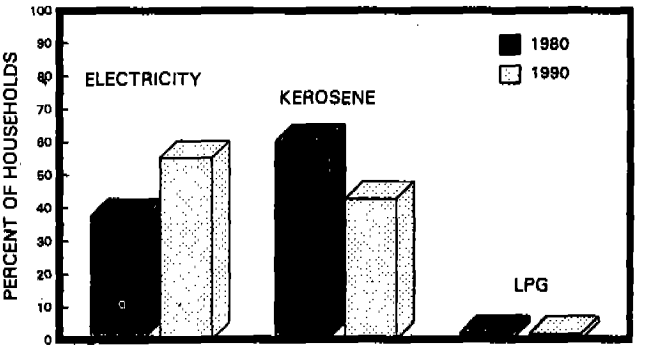
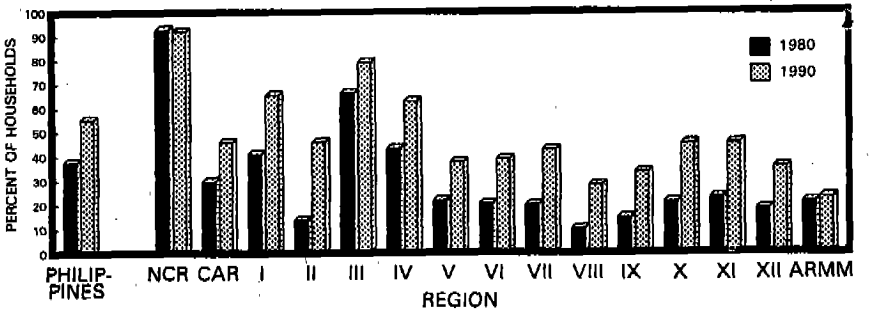


Fig. 27 shows the percentage of households per region that used electricity in 1980 and 1990. In 1980, the bulk of electricity-using households was concentrated in Metro Manila, the Ilocos, Central Luzon, and Southern Tagalog. Since then, the other regions have partly caught up with the Metro area and surrounding provinces by doubling or tripling, as in the case of Cagayan Valley, the proportion of electrified households. To entirely catch up, the Visayas and Mindanao still have some ways to go.

FIGURE 27. Households Using Electricity, by Region: Philippines, 1980 and 1990 (In percent)



Use of electricity is dependent first on the availability of electricity, but there are other factors as well that prevent private households in barangays with electricity connection to make use of this energy source. According to the 1990 Census of Barangays, some 60 percent of all barangays in the country had electricity connections. In these barangays lived close to 8.8 million households, but only 6.3 million of them used electricity, while 2.5 million did not. It is unknown how many of these latter households were located in sitios a fair distance away from the barangay center and without connection to the barangay power line, but it is known that many households do not connect because they cannot afford to. Fig. 28 points out that not connected families and households were concentrated in rural barangays, and that among the country's 15 regions, Eastern Visayas had the relatively largest share of such households in both urban as well as rural barangays.

The probably most important purpose for which households need energy is *cooking*. Over the last couple of decades, most Philippine households have chosen between four types of cooking fuel: (1) wood or charcoal, (2) LPG (liquified petroleum gas), (3) kerosene, and (4) electricity. As illustrated in Fig. 29, wood and charcoal are by far the

FIGURE 28. Households with Electricity Connection that Use and Do Not Use Electric Light, by Stratum and Region: Philippines, 1990 (In percent)

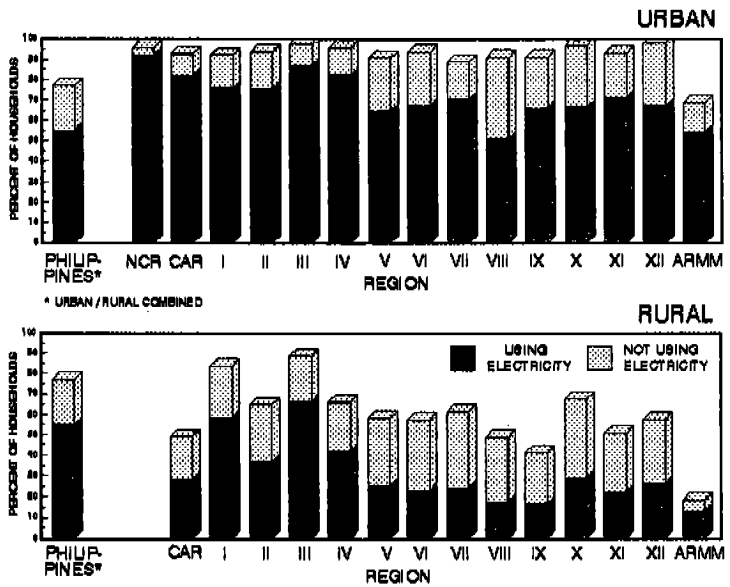
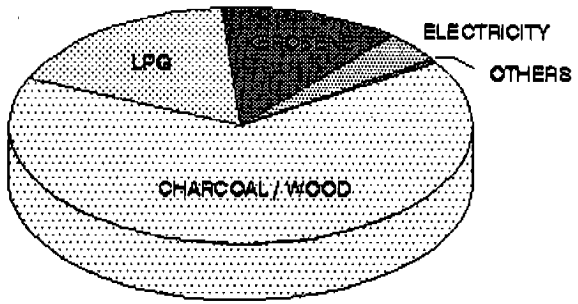


FIGURE 29. Households by Type of Cooking Fuel Used: Philippines, 1990 (In percent)



most important types of cooking fuel, used by two thirds of all households (about 7.5 million) in 1990. In the short term and for individual households, wood is the economically cheapest fuel available; in the long run and for the country as a whole, it probably is the most expensive since its use contributes significantly to the depletion of forest resources. From a health point, it is the least desirable because the smoke it generates pollutes the air in and around people's living quarters.

Urban-rural differences in the use of wood for cooking were considerable in 1990. For the country as a whole, the proportion of rural households using wood was twice as large as the proportion of urban households: 43 percent versus 87 percent. The least firewood was used by Metro Manila households: just 6.6 percent. However, there were relatively large differences even in the Metro area. In Caloocan City, Navotas and Valenzuela, the proportions of households with wood stoves exceeded the average proportion of such households in NCR by almost 100 percent. The administrative districts with the least wood-burning households in the Metro Area were Mandaluyong and San Juan (4 percent of all households).

During the 1980s, the proportion of households using wood/charcoal as cooking fuel declined by some 6 percent, from 72 to 66. However, the absolute number of such households increased from 6.2 to 7.5 million. Most of the decline in the proportion of wood-using households occurred in the Luzon regions. During the same period, the use of LPG increased in every region (Table 26). The use of kerosene as cooking fuel likewise increased, though to a lesser degree. Electricity is the commercially most expensive cooking fuel and used by relatively few households outside of Metro Manila. In the metropolis, the proportion of households cooking with electricity decreased between

TABLE 26. Households by Type of Cooking Fuel Used: Philippines and its Regions, 1980 and 1990 (In percent)

Region	Wood / Charcoal		LPG		Kerosene		Electricity		Others	
	1980	1990	1980	1990	1980	1990	1980	1990	1980	1990
PHILIPPINES	**72.3**	**65.7**	**11.7**	**17.1**	**11.8**	**12.6**	**3.4**	**4.0**	**0.8**	**0.6**
National Capital Region (NCR)	7.4	6.6	43.9	48.2	34.0	33.1	14.4	11.9	0.3	0.2
Cordillera (CAR)	74.9	62.5	9.9	25.8	12.4	8.0	1.8	3.4	1.0	0.3
Ilocos (I)	84.1	77.2	7.9	14.8	5.3	4.8	1.5	2.6	1.2	0.6
Cagayan Valley (II)	89.3	81.7	3.1	10.6	6.5	4.8	0.7	2.1	0.4	0.8
Central Luzon (III)	65.1	49.2	16.8	29.3	12.5	16.2	3.7	4.5	1.9	0.8
Southern Tagalog (IV)	71.8	60.4	12.1	22.2	11.6	12.8	3.7	4.3	0.8	0.3
Bicol (V)	88.6	85.9	3.3	6.4	6.4	5.7	0.6	1.1	1.1	0.9
Western Visayas (VI)	87.6	87.0	3.3	6.0	6.4	4.9	0.8	1.4	1.9	0.7
Central Visayas (VII)	85.1	80.6	5.5	8.1	4.5	8.8	0.5	1.7	4.4	0.8
Eastern Visayas (VIII)	89.6	88.1	2.2	4.2	6.5	6.3	0.3	1.1	1.4	0.3
Western Mindanao (IX)	84.7	85.6	3.0	3.9	9.2	7.5	0.9	2.5	2.2	0.5
Northern Mindanao (X)	87.5	83.8	2.9	3.7	6.6	8.1	2.2	3.0	0.8	1.4
Southern Mindanao (XI)	83.9	79.2	4.8	4.9	8.6	12.2	1.0	3.1	1.7	0.6
Central Mindanao (XII)	83.9	84.9	2.0	2.6	9.4	8.4	2.4	3.3	2.3	0.8
Muslim Mindanao (ARMM)	84.9	82.9	2.3	3.9	9.6	9.5	1.0	2.2	2.2	1.5

1980 and 1990 from 15.2 to 11.9 percent. Most NCR households that gave up electricity as cooking fuel apparently switched to LPG, which had been used by less than 12 percent of them in 1980 but was utilized by more than 17 percent in 1990. Country-wide in 1990, the use of wood as cooking fuel was most common in the Visayas regions, followed by the regions of Mindanao. In Luzon, it were the Bicol and Cagayan Valley households that relied most heavily on wood. The areas in which the smallest proportions of households used firewood for cooking purposes were Central Luzon and Southern Tagalog. The regional shifts in the use of cooking fuel during the 1980 are indicated in Table 26.

e. *Potable water*. The 1990 Census lists six main sources of potable water and classifies the first three as *safe*, and the remaining as *unsafe*. The first two safe sources, community water system and piped deep well, are subdivided according to form of access, which may be either private or shared (communal).

The figures in Table 27 indicate that about one fourth of all households in the country, numbering 3.1 million, had to rely on unsafe water sources. Eighty percent of these households lived in rural areas.

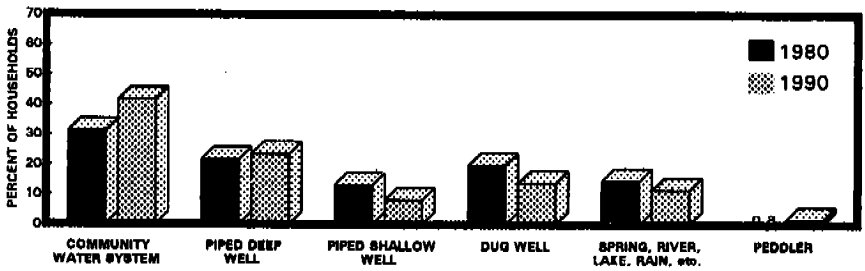
TABLE 27. Households by Drinking Water Source and Stratum: Philippines, 1990

Type of water source	All Strata		Urban		Rural	
	Households	%	Households	%	Households	%
All Water Sources	**11,407,262**	**100.0**	**5,582,480**	**100.0**	**5,824,782**	**100.0**
Community water system,						
private	2,572,360	22.6	2,077,089	37.2	495,271	8.5
shared	2,169,74	319.0	1,350,908	24.2	818,835	14.1
Piped deep well,						
private use	967,399	8.5	503,188	9.0	464,211	8.0
communal use	1,696,143	14.9	784,683	14.0	911,460	15.6
Piped shallow well	920,165	8.1	276,605	5.0	643,560	11.1
Dug well	1,566,243	13.7	267,560	4.8	1,298,683	22.3
Spring, lake, river, rain, etc.	1,313,963	11.5	171,440	3.1	1,142,523	19.6
Peddler	201,246	1.7	151,007	2.7	50,239	0.8

The most widely frequented water sources in rural areas were shallow dug wells and springs, lakes, rivers, and rain. Safe water sources in rural areas tend to be communal ones. In urban places, only a little more than one third of all households had their own private water faucets connected to a communal water system. Buying water from street peddlers is primarily an urban phenomenon; in 1990, urban households were three times as likely to buy water from a street vendor than rural households. According to some health officials, water bought from peddlers is the most unsafe water for human consumption. In Metro Manila, 4.5 percent of all households in 1990 bought most of their drinking water on street corners. It occurred most often in Pateros and Taguig, where some18 percent of all households relied on this particular type of water source.

While the overall drinking water situation in the country in 1990 was still extremely unsatisfactory, improvements had been made during the 1980s, as Fig. 30 illustrates. The proportion of households dependent on unsafe water sources had declined during that period by some 7 percent with the result that the number of such households had practically stagnated at the 1980 level (3.1 million in 1990 versus 3million in 1980). On the other hand, the proportion of households with piped water from either communal water systems or deep wells (with both inhouse or communal access) had increased from 53 to 65 percent, which, translates into three million households.

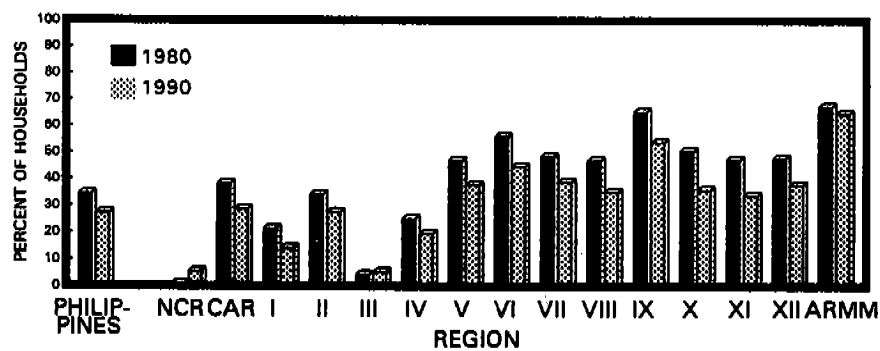
FIGURE 30. Households by Main Source of Drinking Water: Philippines, 1980 and 1990 (In percent)



Reductions in the proportions of households using unsafe drinking water between 1980 and 90 occurred mostly in regions that, in 1980, had the largest proportions of such households, i.e., the Visayas and Mindanao (Fig. 31). The only exception is ARMM, the region in which in 1980 a larger proportion of households than anywhere else in the country (67 percent) had to rely on unsafe drinking water sources. Ten years later, this proportion had shrunk only marginally: to 64 percent. A second region in which water-source improvements during the 1980s did not succeed in bringing the proportion of households with unsafe drinking water below the 50 percent mark is Western Mindanao.

f. *Waste Disposal.* Improper waste disposal not only defaces the natural environment but represents one of the most dangerous public health hazards. Of special importance is the disposal of human waste, which takes place either inside the dwelling units that households

FIGURE 31. Households with Unsafe Sources of Drinking Water, by Region: Philippines, 1980 and 1990



occupy or very near the dwelling units in cases households do not possess their own private toilets.

The Philippine censuses distinguish between relatively *sanitary* toilet facilities, and *less sanitary* ones. Included among the first are facilities such as household-owned or household-shared water-sealed toilets connected to either public sewerage systems , septic tanks or other kinds of depositories. The use of sanitary facilities depends on the availability of running water. Less sanitary types of toilets, in descending order of preference, are pits which may be closed or open, pail or similar systems, and "no facility whatsoever," often referred to as "wrap-and-throw" method. The latter two kinds of "facility" usually make people spread their own waste in the immediate neighborhood of their dwellings.[23]

At first glance, it may seem that a water-sealed toilet connected to a public sewerage system is the most hygienic method of disposing human waste. In the Philippines, such sewerage systems are usually found only in larger urban areas. How sanitary such a system really is depends on the type of sewerage: it may be a closed piped system shielding the public from the waste, or one in which the waste is emptied into open sewerage canals (esteros). In the census classification of toilet facilities, no account is taken of this sewerage-system difference.

Less than one half of all private households in the country in 1990, as Table 28 shows, had a sanitary (water-sealed) toilet in their dwellings used exclusively by their members.Together with those households that shared a water-sealed toilet with other households, they account for less than 60 percent of all households in the country. Two thirds of all water-sealed toilets, private and shared, were found in urban households. Every tenth urban household in 1990 either had no access to any toilet or used some kind of pail system. The most common "toilet facility" in rural areas was "none", "enjoyed" by one-fourth of all rural households. The proportion of rural households with no sanitary toilet facility was three times as large as the corresponding proportion of households in urban areas.

In Metro Manila, 91 percent of all households used sanitary toilets, three-fourths of which were privately owned, and the remainder shared with others. The administrative district with the worst toilet conditions

23. The definition of 'open pit' is very flexible. It may mean, among other things, drilling holes into culverts or other covers of the drainage system.

TABLE 28. Households by Type of Toilet Facility and Stratum: Philippines, 1990

	All Strata		Urban		Rural	
	Households	%	Households	%	Households	%
ALL TYPES OF TOILETS	**11,407,262**	**100.0**	**5,582,480**	**100.0**	**5,824,782**	**100.0**
Water-sealed						
private	5,151,691	45.2	3,361,651	60.2	1,790,040	30.7
shared	1,475,944	12.9	985,534	17.7	490,410	8.4
Closed pit	1,082,760	9.5	320,408	5.7	762,352	13.1
Open pit	1,639,078	14.4	337,347	6.0	1,301,731	22.4
Pail system, others	227,671	2.0	104,571	1.9	123,100	2.1
None	1,830,118	16.0	472,969	8.5	1,357,149	23.3

in NCR was Navotas, where only two-thirds of all households had access to sanitary toilet facilities, and 21 percent had access to none. The latter proportion is more than twice as large as that in the second-worst NCR district toilet-wise, Malabon (9 percent), and more than three times as large as that found in the city of Manila (6 percent).

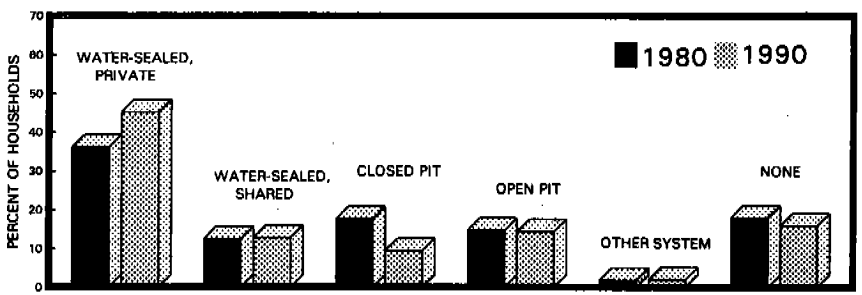
Table 29 lists, per region, the proportions of all households by type of toilet facility used. The table illustrates the uneven situation with respect to basic human hygiene. The worst situation in the country in 1990 with respect to availability of toilets existed—in urban and rural areas alike—in the Visayas especially its eastern and central portions. The difference between the Visayas and other areas with below par situations— such as the Cordillera, Bicol and most of Mindanao —is that, in the Visayas, the proportions of households with no toilet facilities at all was extremely large (more than one-half of all households in Western Samar, and about one-third in Central and Eastern Visayas combined), while in other poorly equipped areas of the country most households had access to at least an open pit which, more often than not, was used by more than one household. In Tawi-Tawi, e.g., which registered the smallest proportion of households with sanitary toilets in 1990, more than 50 percent of the households indicated to have access to open pits, and another 9 percent reported access to closed ones.

Improvements in the accessibility of toilets by households during the decade of the 1980s were small in relative terms, as Fig. 32 illustrates. The percentage of households with private water-sealed

TABLE 29. Households by Region and Type of Toilet Facility: Philippines, 1990 (In percent)

Region	Sanitary	Non-sanitary	None
PHILIPPINES	**58.1**	**25.9**	**16.0**
National Capital Region	90.9	5.4	3.7
Ilocos (I)	76.5	20.0	3.5
Cagayan Valley (II)	70.0	24.9	5.1
Central Luzon (III)	70.0	20.1	9.9
Southern Tagalog	56.9	24.1	19.0
Bicol			
Western Visayas (VI)	36.4	43.7	19.9
Central Visayas (VII)	48.4	20.3	31.3
Eastern Visayas (VIII)	48.2	15.5	36.3
Western Mindanao (IX)	41.4	33.4	25.2
Northern Mindanao (X)	54.0	30.4	15.6
Southern Mindanao (XI)	55.1	34.1	10.8
Central Mindanao (XII)	46.6	39.8	13.6
Muslim Mindanao (ARMM)	15.3	62.4	22.3

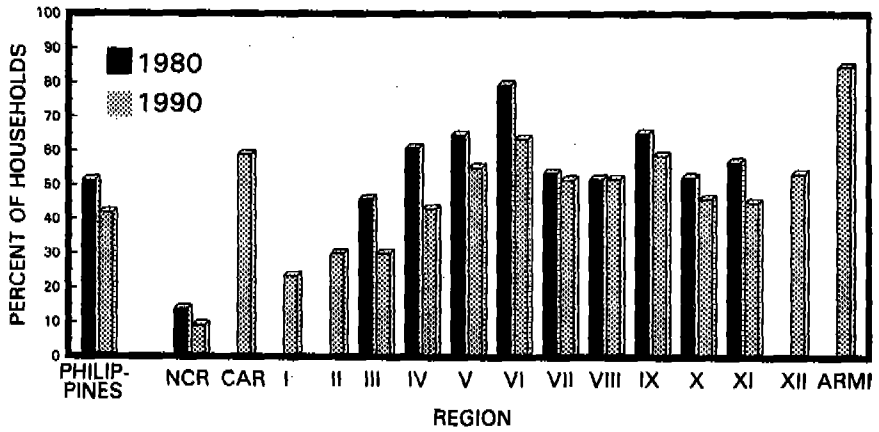
FIGURE 32. Households by Type of Toilet: Philippines, 1980 and 1990 (In percent)



toilets increased by 10 points, while the proportion of households with access to closed pits decreased by about as much. The number of households without any toilets declined from 18 percent in 1980 to 16 percent in 1990. With respect to all other toilet types, the situation remained basically unchanged.

Whatever improvements in sanitary facilities were made during the 1980s, they did not occur everywhere in the country. They were most evident in the central and southern portions of Luzon as well as in the western parts of the Visayas and, to a lesser degree, in Southern Mindanao, as Fig. 33 documents.

FIGURE 33. Households with Non-sanitary Toilet, by Region: Philippines, 1980 and 1990 (In percent)



A closer scrutiny of the census data reveals that increases in the proportions of households with access to sanitary toilet facilities were most pronounced in the provinces of Central Luzon and the Luzon-based provinces of Southern Tagalog. In Central and Eastern Visayas as well as in Cagayan Valley, the proportions of such households remained virtually unchanged. In the very same regions, the proportions of households with no toilet facility likewise remained unchanged, resulting in a sizeable increase in the number of such households. In two regions with large Muslim populations, they increased: in Western Mindanao by more than 5 percent, and in ARMM by 7.5 percent.

The 1990 Census of Population and Housing is the first in Philippine census history to collect information on domestic waste disposal. Domestic waste, which forms only a part of the total waste generated in the country, is primarily created in the context of household food preparation, cooking and consumption of food, as well as other household activities including cleaning, gardening, etc. Garbage, indiscriminately thrown about, not only defaces the environment but contaminates it. In a 1994 study, Perez *et al.* report that "domestic waste generation in the metropolis is estimated at 0.64 kilograms per capita per day, which is equivalent to 5,448 tons per day."[24] Of this garbage, some 85 percent are collected, while the

24. In a 1982 study, Norconsult estimated that food and kitchen waste constitutes the largest component of the waste stream. Perez *et al.* "Differences in Garbage Disposal Practices in Filipino Households." Manila, 1994 (mimeographed).

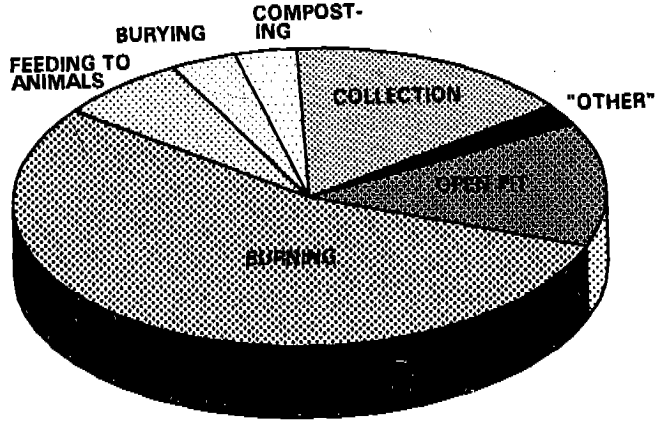
remaining 15 percent (817 tons) find their way into vacant lots, rivers, esteros, and streets, posing a serious threat to public health and environmental preservation.

The 1990 Census inquired from households about their "usual manner of garbage disposal." The answers are classified in terms of seven "usual manners": (1) *Collection* by either local government or private contractor, (2) *dumping* in open space or pit and left to decay, (3) *burning* in an open pit or space, (4) *composting* under controlled conditions; composted materials are later collected for use as soil conditioner or fertilizer, (5) *burying* garbage by throwing in a pit and covering with soil, (6) *feeding to animals*, and (7) *"others,"* such as throwing into esteros, vacant lots, rivers and streets.

The extent to which the answers as to "usual manner of disposal" given by the census respondents are in agreement with actual behavior is a question worth investigating. The Perez (1994) paper cited earlier asserts that 15 percent of the household garbage in the metropolis is disposed of "the other way," i.e., thrown around. By contrast, the 1990 Census states that, in NCR, just 2 percent of all households usually dispose of their waste "the other way." It is unlikely that these 2 percent of NCR households generate 15 percent of the total household garbage in the area.

Of the seven usual manners of garbage disposal enumerated, 84 percent of all households in the country relied on just three of them:

FIGURE 34. Households by Usual Manner of Garbage Disposal: Philippines, 1990 (In percent)



garbage collection, burning, and dumping in an open space or pit. Only the first of these methods, when properly executed and the collected garbage is deposited in a not health-endangering manner—which often it is not!—meets acceptable standards; the third method is always health-endangering, and the second tends to be so if applied in a densely populated neighborhood.

There was relatively little difference in the manner of garbage disposal between urban and rural households aside from the fact that garbage collection, the second most often used manner of garbage disposal in urban localities, was practically non-existent in rural places. Not health-threatening ways of disposal, such as composting and burying, played a negligible role in urban as in rural areas.

Aside from the use of "other methods" of garbage disposal, which admittedly was practiced by 2.5 percent of all households nationwide and which may be translated as "throwing it just anywhere," the most health-detrimental manner of garbage disposal is that of dumping into open spaces or pits on private or public property. Nationwide, 13.5 percent of all households admitted to using this method, with little difference between urban and rural ones. In terms of local areas, the entire Cordillera region, the island of Samar, and the majority of Mindanao provinces are clearly standing out. In Ifugao, the proportion of garbage-dumping households reached 40 percent, in the eastern and western parts of Samar 35 percent, and in Agusan del Sur 30 percent.

In Metro Manila, some 7 percent of the 1,5 million households counted there in 1990 dumped their garbage in open places, and an additional 2 percent used "other methods." As in many other respects, the Metro area is not homogeneous with respect to private and public cleanliness. The most garbage-dumping households resided in Navotas (about 20 percent of all households), and the cleanest household population garbage-wise in Makati (3 percent).

SUMMARY

This paper was prepared for a meeting in Honolulu in February 1995, during which researchers from the International Institute for Applied Systems Analysis (IIASA) in Laxenburg, Austria, and representatives of the Philippine government and Philippine academic institutions, discussed Population-Development-Environment (PDE) interactions. At the meeting, the IIASA researchers demonstrated a prototype of an interdisciplinary model, originally developed for the

island of Mauritius, that is capable of simulating such interactions. The model contains four modules: Population, Economy, Land Use, and Water.[25] The Population module is described as "a multistate model that projects the population by age, sex, and seven socioeconomic states which are defined by the level of education and labor force participation. The module allows changes in age-specific fertility, mortality, migration, school participation, and labor-force entry over time."

In the context of the Honolulu meeting, the purpose of this paper was to exhibit some of the demographic and other population-related information that will be needed if a Philippine PDE model is to be developed. The paper contains no population projections. What it does contain is the basic information needed for projecting the population by age and sex as well as socioeconomic states defined in terms of education and employment. Projections by age and sex for all provinces of the country are routinely prepared and periodically updated by the National Statistics Office of the Philippines, and projections by education and labor force characteristics can be obtained with the help of existing data of the type presented here.

Projections are useful to answer the question as to how many people there will be a number of years from now under given specified conditions. The number of projected people is interesting in itself, but of equal interest is the answer to a second question: can the limited environment in which these people will find themselves sustain them?

A simple way of relating people to "environment" is to calculate population densities. Density figures, when used with the implicit assumption that all land is more or less flat and of equal use, can be very misleading, especially so in a country with a physiography like that of the Philippines where steep mountain ranges, with which all islands of the Philippine archipelago are covered, severely limit the capacity of the land to accommodate residential settlements and agricultural production.

Included in this paper is information on the behavior of households related to available environmental resources and their uses. There is much public lament in the Philippines about deforestation through indiscriminate and large-scale logging by economically powerful and

25. These particular modules were included in the model because they were deemed important for the situation existing in Mauritius. For other countries, other or additional modules may be needed.

politically influential groups, resulting in serious damage to fauna, flora, water table, and agricultural production. But that is only one part of the entire picture: two-thirds of all Philippine households, some 7.5 million in 1990, use wood and charcoal as cooking fuel, thereby contributing their share to the continuing depletion of forest resources. Widespread practices like indiscriminate waste disposal and garbage dumping by households all over the country not only deface the physical environment but turn it into a public health hazard in addition. Powerful local officials propose or attempt to construct golf courses or residential subdivisions or industrial establishments in vital watershed areas without concern for the already precarious water supply situation in many parts of the country, and residential households aggravate the situation by dotting the landscape with innumerable individually-owned water pumps. Any model designed to simulate population-development-environment interactions in the Philippines has to take account of such and related behavioral factors.

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